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August 2, 2011

Mr. Anthony Cinque  
New Jersey Department of Environmental Protection  
Division of Responsible Party Site Remediation  
401 East State Street  
P.O. Box 028  
Trenton, New Jersey 08625-0028

**RE: Wanaque River Remedial Investigation Report – Revised July 2011**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**  
**PI #007411**

Dear Mr. Cinque:

Enclosed for your review is the Wanaque River Remedial Investigation Report (RIR) for the Pompton Lakes Works Site located in Pompton Lakes, New Jersey. One bound copy and three CDs each containing a complete set of figures are included herein.

This document represents a revision to the Wanaque River RIR submitted to the New Jersey Department of Environmental Protection (NJDEP) on July 31, 2010. Revisions to the July 2010 RIR were based on comments provided by NJDEP in a memorandum dated October 26, 2010 and additional sediment and surface water data collected in November 2010.

If you have any questions, please contact me at (973) 492-7733.

Sincerely,

A handwritten signature in black ink, reading "David E. Epps". The signature is written in a cursive, flowing style.

David E. Epps, P.G.  
Project Director, Pompton Lakes Works  
DuPont Corporate Remediation Group

cc: Clifford Ng – USEPA Region II (1 hard copy, 3 CDs)  
PLW Central File



New Jersey Department of Environmental Protection  
Site Remediation Program

REMEDIAL INVESTIGATION REPORT FORM

☐ Non-LSRP (Existing Cases) ☐ LSRP ☐ Subsurface Evaluator

Date Stamp  
(For Department use only)

SECTION A. SITE NAME AND LOCATION

Site Name: \_\_\_\_\_

List all AKAs: \_\_\_\_\_

Street Address: \_\_\_\_\_

Municipality: \_\_\_\_\_ (Township, Borough or City)

County: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Mailing Address if different than street address: \_\_\_\_\_

Program Interest (PI) Number(s): \_\_\_\_\_ Case Tracking Number(s): \_\_\_\_\_

Date Remediation Initiated Pursuant to N.J.A.C. 7:26C-2.2 or 2.3(b): \_\_\_\_\_

State Plane Coordinates for a central location at the site: Easting: \_\_\_\_\_ Northing: \_\_\_\_\_

Municipal Block(s) and Lot(s): Block # \_\_\_\_\_ Lot # \_\_\_\_\_

Block # \_\_\_\_\_ Lot # \_\_\_\_\_ Block # \_\_\_\_\_ Lot # \_\_\_\_\_

Block # \_\_\_\_\_ Lot # \_\_\_\_\_ Block # \_\_\_\_\_ Lot # \_\_\_\_\_

Block # \_\_\_\_\_ Lot # \_\_\_\_\_ Block # \_\_\_\_\_ Lot # \_\_\_\_\_

Block # \_\_\_\_\_ Lot # \_\_\_\_\_ Block # \_\_\_\_\_ Lot # \_\_\_\_\_

SECTION B. REQUIRED TECHNICAL SUBMITTALS

	Not Applicable	Included in this Submission	Previously Submitted	Date of Submission	Date of Revised Submission
Immediate Environmental Concern Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Immediate Response Action Plans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Preliminary Assessment Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Receptor Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Site Investigation Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Remedial Investigation/Remedial Action Work Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Feasibility Study Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Response Action Outcome Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Permit Application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

SECTION C. SITE USE

Current Site Use (check all that apply)

- ☐ Industrial ☐ Agricultural  
☐ Residential ☐ Park or recreational use  
☐ Commercial ☐ Vacant  
☐ School or child care ☐ Government  
☐ Other \_\_\_\_\_

Intended Future Site Use, if known (check all that apply)

- ☐ Industrial ☐ Park or recreational use  
☐ Residential ☐ Vacant  
☐ Commercial ☐ Government  
☐ School or child care ☐ Future site use unknown

SECTION D. PUBLIC FUNDS

Did the remediation utilize public funds? ..... ☐ Yes ☐ No

If "Yes," check applicable: ☐ UST Grant ☐ UST Loan ☐ Brownfield Reimbursement Program  
☐ HDSRF Grant ☐ HDSRF Loan ☐ Landfill Reimbursement Program  
☐ Spill Fund ☐ Schools Development Authority



**SECTION E. SCOPE OF THE REMEDIAL INVESTIGATION REPORT**

☐ Area(s) of Concern Only (If submitted for specific AOC(s), attach Section H2 of the PA/SI form.)

☐ Entire Site (based on a completed and submitted Preliminary Assessment/Site Investigation)

Is the Remedial Investigation complete?..... ☐ Yes ☐ No

**SECTION F. SITE CONDITIONS**

1. Check each media-type and highest concentration of contamination currently present above any applicable standards/criteria:

Soil in ppm						GW = Ground Water in ppb					SW = Surface Water in ppb					Sed = Sediment in ppm				
	Soil ppm	GW ppb	SW ppb	Sed ppm			Soil ppm	GW ppb	SW ppb	Sed ppm			Soil ppm	GW ppb	SW ppb	Sed ppm				
*VOCs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100–1,000		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>1,000			
*SVOCs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100–1,000		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>1,000			
*PAHs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10–100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>100			
*Metals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100–1,000		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>1,000			
PCBs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10–100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>100			
*Pesticides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<1		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1-10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>10			
Dioxin (ppb)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<1 ppb		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1-10 ppb		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>10 ppb			
Chromium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100–1,000		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>1,000			
Mercury	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100–1,000		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>1,000			
Arsenic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<10		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10–100		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	>100			
TPHC	<input type="checkbox"/>			<input type="checkbox"/>	<1,700		<input type="checkbox"/>			<input type="checkbox"/>	1,700–5,100		<input type="checkbox"/>			<input type="checkbox"/>	>5,100			

2. For any contaminant group (\*) checked above, identify the compound/element with the highest concentration over its applicable remediation standard:

\_\_\_\_\_

3. Were the laboratory reporting minimum detection limits below applicable remediation standards/criteria required for the site?..... ☐ Yes ☐ No

4. Are any of the following conditions currently present? (check all that apply)

**Groundwater:**

- ☐ Contaminated ground water in the overburden aquifer
- ☐ Contaminated ground water in a confined aquifer
- ☐ Contaminated ground water in the bedrock aquifer
- ☐ Contaminated ground water in multiple aquifer units
- ☐ Multiple distinct ground water plumes
- ☐ Contaminated ground water migrating off-site
- ☐ Co-mingled on-site ground water plumes
- ☐ Co-mingled ground water plumes from both on-site and off-site sources
- ☐ Contaminated ground water discharging to surface water
- ☐ Residual or free product
- ☐ Radionuclides

**Soil:**

- ☐ On-site discharge(s) impacting soil off-site
- ☐ Chromate Production Waste
- ☐ Munitions and explosives of concern
- ☐ Contaminated soil in the saturated zone
- ☐ Historic pesticide impacts to soil
- ☐ Residual or free product
- ☐ Radionuclides
- ☐ Historic Fill
- ☐ Soil contamination due to naturally occurring background conditions

## SECTION G. APPLICABLE REMEDIATION STANDARDS

Indicate the Remediation Standards used for all compounds (check all that apply)

- ☐ Default (check all that apply below)
- ☐ Direct Contact      ☐ Impact to Ground Water Soil Screening Levels      ☐ Ecological Screening Levels
- ☐ Alternate Remediation Standards for the Ingestion/Dermal Pathway
- ☐ Alternate Remediation Standards for the Inhalation Pathway
- ☐ Site Specific Standards for the Impact to Ground Water Pathway (check all that apply)
- ☐ Soil-Water Partitioning Equation      ☐ SPLP      ☐ Sesoil      ☐ Sesoil/AT123D
- ☐ Ecological Remediation Goals

What is the ground water classification for this site as per N.J.A.C. 7:9C? (check all that apply)

- ☐ Class I-A      ☐ Class II-A
- ☐ Class I-PL Pinelands Protection Area      ☐ Class III-A
- ☐ Class I-PL Pinelands Preservation Area      ☐ Class III-B

## SECTION H. BACKGROUND CONDITIONS

1. Have all contaminants found in soil and ground water on site been linked to on-site areas of concern? ..... ☐ Yes    ☐ No
2. Did the RI demonstrate via a background investigation, outside the influence of on-site AOCs **and** operational areas, that:
- a. all or any part of the ground water contamination is migrating onto this site per N.J.A.C. 7:26E-3.7(g)? ..... ☐ Yes    ☐ No    ☐ NA
- b. soil contamination is naturally occurring per N.J.A.C. 7:26E-3.10 ..... ☐ Yes    ☐ No    ☐ NA

## SECTION I. ALTERNATIVE STANDARD / DEVIATIONS

### Alternative remediation standard

If proposing an alternative remediation standard pursuant to N.J.A.C. 7:26D-7.4, check here and attach the Alternative Soil Remediation Standard Application Form as an addendum. ☐

### Deviation from regulations

If the Licensed Site Remediation Professional has varied from the Technical Rules, provide the citation(s) from which the remediation varied and the page(s) in the attached document where the rationale for the deviation is provided.

N.J.A.C. 7:26E- \_\_\_\_\_ Page \_\_\_\_\_

N.J.A.C. 7:26E- \_\_\_\_\_ Page \_\_\_\_\_

N.J.A.C. 7:26E- \_\_\_\_\_ Page \_\_\_\_\_

## SECTION J. HISTORIC FILL

1. The presence of historic fill is supported by (check all that apply):
- ☐ Boring logs      ☐ Test Pits      ☐ Trenches      ☐ Aerial Photos      ☐ NJDEP Mapped Areas
- ☐ No historic fill identified at the site. If none, skip to K. below.
2. How was the historic fill characterized pursuant to N.J.A.C. 7:26E-4.6? (check all that apply)
- ☐ Samples were collected outside areas potentially impacted by on-site operations (i.e., AOC(s))
- ☐ Contaminant levels in Table 4.2 at N.J.A.C. 7:26E-4.6
3. Are any other AOCs (i.e., location of discharge and any contaminants that may have migrated from that area) located within the defined boundaries of the historic fill? ..... ☐ Yes    ☐ No
- If "No," skip to K. below
4. Have the same contaminant type(s) (e.g., lead, arsenic, and/or benzo(a)pyrene, etc.) characterized as being present in the historic fill been **sampled for** as a contaminant of concern at these co-located AOCs? ..... ☐ Yes    ☐ No

## SECTION K. GROUND WATER TRIGGER

Was a ground water investigation conducted at all AOCs where a ground water investigation was triggered pursuant to N.J.A.C. 7:26E-4.4 (a)? ..... ☐ Yes    ☐ No    ☐ NA

**SECTION L. GROUND WATER REMEDIAL INVESTIGATION INFORMATION**

1. Were any monitor wells installed in unconfined aquifers in which the water table is higher than the top of the well screen? ..... ☐ Yes ☐ No  
If "Yes," identify the affected wells \_\_\_\_\_
2. If ground water in the bedrock aquifer is contaminated, were bedrock cores collected and/or were geophysical logging methods conducted to characterize the bedrock aquifer pursuant to N.J.A.C. 7:26E-4.4(g)5? ..... ☐ Yes ☐ No ☐ NA

**SECTION M. LABORATORY DATA**

1. Were all data submitted in the appropriate full and/or reduced formats according to the deliverables defined in N.J.A.C. 7:26E-2? ..... ☐ Yes ☐ No
2. Do all data submitted meet the quality assurance/quality control (QA/QC) requirements incorporated by reference in N.J.A.C. 7:26E-2 for:  
sampling ..... ☐ Yes ☐ No  
analysis ..... ☐ Yes ☐ No
3. How was it determined that the data complied with the QA/QC requirements?  
☐ Laboratory non-conformance summary/narrative  
☐ Laboratory correspondence  
☐ LSRP review  
☐ Independent contractor review  
☐ Other: \_\_\_\_\_
4. Has any data been qualified and used? ..... ☐ Yes ☐ No
5. Has any data been rejected and used? ..... ☐ Yes ☐ No
6. If clean fill has been brought onto the site, has it been analyzed? ..... ☐ Yes ☐ No
7. Comments:

**SECTION N. MISCELLANEOUS**

1. Were any regulated USTs identified during the course of the RI that were not previously known? ..... ☐ Yes ☐ No  
If "Yes," list tank size, contents and registration number(s). \_\_\_\_\_
2. If "Yes," to item M.1. above and if these USTs were Federally Regulated, was the source/cause of release identified on a Confirmed Discharge Notification form? ..... ☐ Yes ☐ No  
If "No," complete and submit a revised Confirmed Discharge Notification form.
3. Identify Remedial Measures (RMs) conducted during the RI (check all that apply):  
☐ Soil excavation ☐ UST closure  
☐ Potable water supply treatment or replacement ☐ Free product recovery  
☐ Hydraulic containment of source area ☐ Vapor intrusion mitigation  
☐ Soil vapor extraction ☐ No RMs were conducted during the RI  
☐ Enhanced fluid recovery (EFR)  
☐ Other(s), specify: \_\_\_\_\_
4. Did the remedial investigation include sampling to characterize any on-site contaminated media for either on-site or off-site reuse? ..... ☐ Yes ☐ No
5. Has new information (material facts, data or other information) been generated during the RI that corrects or contradicts information, or changes conclusions from, previously submitted reports or information? ..... ☐ Yes ☐ No  
If "Yes," explain: \_\_\_\_\_

**SECTION O. PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION**Full Legal Name of the Person Responsible for Conducting the Remediation: E.I. du Pont de Nemours and CompanyRepresentative First Name: Michael Representative Last Name: LukasTitle: Remediation Team ManagerPhone Number: (302) 999-3567 Ext: \_\_\_\_\_ Fax: \_\_\_\_\_Mailing Address: Chestnut Run Plaza Bldg 715 4417 Lancaster PikeCity/Town: Wilmington State: DE Zip Code: 19805Email Address: Michael.J.Lukas@usa.dupont.comDeveloper Certification Included ☐ or Filed \_\_\_\_\_ Date of Filing \_\_\_\_\_

This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

*I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.*

Signature:  Date: July 29, 2011Name/Title: Michael J. Lukas, DuPont Remediation Team Manager No Changes Since Last Submittal ☐

**SECTION P. NON-LSRP SITE REMEDIATION PROFESSIONAL STATEMENT**First Name: Gary Last Name: LongPhone Number: (215) 367-2476 Ext: \_\_\_\_\_ Fax: (215) 367-1000Mailing Address: 335 Commerce DriveCity/Town: Fort Washington State: PA Zip Code: 19034Email Address: Gary\_Long@urscorp.com*I believe that the information contained herein, and including all attached documents, is true, accurate and complete.*Signature:  Date: 8/2/11Name/Title: Gary R. Long/Project Ecologist**No Changes Since Last Submittal** ☐Company Name: URS Corporation

Completed forms should be sent to:

Bureau of Case Assignment & Initial Notice  
New Jersey Department of Environmental Protection  
Site Remediation Program  
401 East State Street, PO Box 434  
Trenton, NJ 08625

**H2. Areas of Concern (For PA or PA/SI Report, list each AOC; for SI Report, list only AOCs documented in this submittal.)**

	Area of Concern	Currently Exists? <input type="checkbox"/> if "Yes"	Formerly Existed? <input type="checkbox"/> if "Yes"	Investigation	
				SI Conducted <input type="checkbox"/> if "Yes"	RI Proposed <input type="checkbox"/> if "Yes"
1	Above ground storage tank and associated piping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Area of stressed vegetation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Area which receives flood or storm water from potentially contaminated areas	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	Chemical storage cabinet and closet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Compressor vent discharge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Discharge area pursuant to N.J.A.C. 7:1E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Discolored or spill area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Drainage swale and culvert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Drywell and sump	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Dumpster	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Electrical transformer and capacitor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Floor drain collection system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Former agricultural applied pesticide area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Hazardous material storage or handling area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Historic fill or any other fill material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Hydraulic lift	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Incinerator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Landfill or landfarm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Loading and unloading area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Non-contact cooling water discharge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Open area away from production area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Piping, above ground and below ground pumping station, sump and pit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Process area sink and piping which receive process waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Rail car	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Roof leader when process operations vent to the roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Septic system, leachfield or seepage pit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	Silo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Sprayfield	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Storage pad including drum and/or waste storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Storm sewer and spill containment collection system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	Storm water detention pond and fire pond	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	Surface impoundment and lagoon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33	Surface water body	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
34	Underground piping including industrial process sewer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	Underground storage tank and associated piping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	Waste pile as defined by N.J.A.C. 7:26	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	Waste water treatment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Wanaque River  
Remedial Investigation Report  
PI #007411  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Initial Date: July 2010  
Revised Date: July 2011

Project No.: 18985452



URS Corporation  
335 Commerce Drive  
Suite 300  
Fort Washington, PA 19034

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## Acronyms

Acronym/Abbreviation	Definition
ACO	Administrative Consent Order
ADQM	Analytical Data Quality Management
Amsl	Above mean sea level
AOC	Area of Concern
ATV	All-terrain vehicle
AVS	Acid volatile sulfides
BEE	Baseline Ecological Evaluation
Bgs	Below ground surface
BTv	Background threshold values
Cfs	Cubic feet per second
CGWMP	Comprehensive Groundwater Monitoring Program
CID	Case inventory document
COPEC	Constituent of Potential Ecological Concern
CSM	Conceptual Site Model
DDR	DuPont data review
DERS	DuPont Environmental Remediation Services
DuPont	E.I. du Pont de Nemours and Company
EDS	Electronic data submittal
EMA	Eastern Manufacturing Area
EPA	U.S. Environmental Protection Agency
ESNRs	Environmentally sensitive natural resources
ft/ft	Feet per foot
GPS	Global positioning system
GWIIA	New Jersey Class IIA aquifer groundwater standards
HMW	High molecular weight
in/yr	Inches per year
IRM	Interim remedial measures
LEL	Lowest effect level
MDL	Method detection limit
MS/MSD	Matrix Spike/Matrix Spike duplicate
NAD83	New Jersey State Plane Coordinate System 1983
NJDEP	New Jersey Department of Environmental Protection
NJRDCSCC	New Jersey Residential Direct Contact Soil Cleanup Criteria
NJRDCSRS	NJDEP Residential Direct Contact Soil Remediation Standards
NMA	Northern Manufacturing Area
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PLW	Pompton Lakes Works
QA/QC	Quality assurance/quality control
RASR	Remedial Action Selection Report
RBP	Rapid Bioassessment Protocol
RDCSRS	NJDEP Residential Direct Contact Soil Remediation Standards
RI	Remedial investigation
RIR	Remedial Investigation Report
ROW	Right-of-way
RPD	Relative percent difference
SEL	Severe effects level
SEM	Simultaneously extractable metals
SIWP	Site Investigation Work Plan

<b>Acronym/Abbreviation</b>	<b>Definition</b>
SVOCs	Semi-volatile organic compounds
THg	Total mercury
TOC	Total organic carbon
TRSR	New Jersey Technical Requirements for Site Remediation
TSS	Total suspended solids
USACE	United States Army Corps of Engineers
USGS	U.S. Geological Survey
VOCs	Volatile organic compounds
WMA	Western Manufacturing Area

## Executive Summary

This revised remedial investigation report (RIR) presents the findings of remedial investigations conducted to date in the Wanaque River in the vicinity of the E.I. du Pont de Nemours and Company (DuPont) Pompton Lakes Works (PLW) site located in Pompton Lakes, New Jersey. This document represents a revision to the Wanaque River RIR submitted to the New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (EPA) on July 31, 2010. Revisions to the July 2010 RIR were based on comments provided by NJDEP in a memorandum dated October 26, 2010 and additional sediment and surface-water data collected in November 2010.

Surface-water and sediment data were used along with historical investigations conducted in adjacent upland soils in the former Northern Manufacturing Area (NMA) and former Western Manufacturing Area (WMA) to develop and refine a conceptual site model (CSM) for the river. Specific objectives of the RIR are as follows:

- Characterize physical and chemical conditions in the Wanaque River in order to refine the existing CSM for the river.
- Evaluate potential migration pathways of site-related constituents in surface water and sediment to the Wanaque River and actual or potential receptors
- Determine whether further evaluation or action is warranted within the river.

Data from a 1990 sampling effort in the Wanaque River was not deemed complete to achieve the objectives of this RIR. The 1990 dataset was collected prior to the removal and/or stabilization of adjacent upland soils that may have contributed site-related constituents to the river and, therefore, were not representative of current conditions. As such, a surface-water and sediment sampling program was implemented in three river reaches to establish baseline analytical datasets and habitat information to support future ecological risk evaluations, as warranted.

The sediment and surface-water program presented in this RIR was implemented in two phases: Phase I (December 2009) and Phase II (November 2010). Phase I sampling was conducted to provide adequate sediment and surface-water data to characterize baseline conditions in the Wanaque River upstream, adjacent to, and downstream of the site. Based on the Phase I sediment and surface-water results, a Baseline Ecological Evaluation (BEE) was conducted, as presented in Appendix A. The findings of the Phase I RI and the BEE were used to focus additional data collection during the Phase II sampling conducted in November 2010 to further refine the CSM and support ecological evaluations.

The results of Phase I and II sediment and surface-water investigations in the Wanaque River support the following conclusions:

- Given the frequency of detection, frequency of exceedances, and elevated concentrations, mercury is the primary sediment constituent of potential ecological concern (COPEC) in the Wanaque River adjacent to and downstream of the PLW site.

- The primary contaminant transport pathway from former site operations to the Wanaque River is likely historical migration from the adjacent uplands and floodplain. The current conditions of river banks and floodplain/upland areas adjacent to Reach 2 are stable and vegetated, which limits the mobilization of particulate-bound COPECs to the river.
- Surface-water concentrations of filtered and unfiltered total mercury (THg) and other site-related metals are below chronic surface-water criteria for the protection of aquatic life (i.e., NJSWQS, NRWQC); therefore, no unacceptable risks to aquatic life are identified for surface-water exposure.
- Mercury concentrations in sediment in the lower portion of Reach 2 (within a zone of sediment deposition downstream of WR-16 to the former dam) increased in relation to upstream samples within Reach 1 and 2 and then decreased substantially in the spatially limited depositional features downstream of the former dam (Reach 3).
- With the exception of the zone of sediment deposition immediately upstream of the former dam, fine-grained sediment deposits represent a relatively minor component (approximately 5-10 percent) of overall habitat availability in Reaches 2 and 3.

Based on the integrated findings of the Phase I and Phase II investigations in the Wanaque River, it is recommended that an Interim Remedial Measure (IRM) be implemented consistent with the *NJDEP Technical Requirements for Site Remediation* (7:26E-1.12) to mitigate potential human and ecological exposure to mercury in depositional sediments in Reach 2 downstream of WR-16 to the former dam. Consistent with this recommendation, an IRM work plan will be submitted to address mercury concentrations elevated above NJRDCSRS within 60 days of NJDEP approval of this RIR.

## 1.0 Introduction

This revised remedial investigation report (RIR) presents the findings of surface-water and sediment remedial investigations conducted to date in the Wanaque River in the vicinity of the E.I. du Pont de Nemours and Company (DuPont) Pompton Lakes Works (PLW) site located in Pompton Lakes, New Jersey (see Figure 1). This document represents a revision to the Wanaque River RIR submitted to the New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (EPA) on July 31, 2010. Revisions to the July 2010 RIR were based on comments provided by NJDEP in a memorandum dated October 26, 2010 and additional sediment and surface-water data collected in November 2010. The revised RIR was prepared in accordance with the Technical Requirements for Site Remediation (N.J.A.C. 7:26E-4.8), as amended on February 22, 2011 and is being submitted in accordance with the requirements of the Administrative Consent Order (ACO) (NJDEP, 1988).

Explosives and explosive products were manufactured at PLW from the late 1800s until 1994. Remedial investigations and activities have been ongoing at the site since 1988 to address areas potentially impacted by former site operations. As part of the 1988 ACO for the PLW site, DuPont was required to investigate surface water leaving the site and sediment near the site boundary. An initial investigation of surface water and sediment in the Wanaque River was conducted in 1990. Since the initial investigation, five interim remedial measures (IRMs) have been completed to address contaminated soils in upland areas of the site adjacent to the river.

The Wanaque River study area investigated in this RIR includes three reaches of the river proximate to PLW (see Figure 2):

- Reach 1: Extends approximately 2.0 miles from the Raymond Dam, which forms the Wanaque Reservoir, to the upstream site property boundary. This reach is considered representative of regional background conditions.
- Reach 2: Extends approximately 1.5 miles from the upstream site boundary through the site to the location of the former dam that formed Lake Inez.
- Reach 3: Extends approximately 1.3 miles downstream of the former dam that formed Lake Inez. Sediment and surface-water data collected from this reach are used to evaluate the extent of potential downstream migration of constituents of potential ecological concern (COPECs).

Sediment and surface-water investigations conducted within the study area were implemented in two phases: Phase I (December 2009) and Phase II (November 2010). Phase I sampling was conducted to provide adequate sediment and surface-water data to characterize baseline conditions in the Wanaque River upstream, adjacent to, and downstream of the site (see Figure 2). The Phase I remedial investigation (RI) established baseline analytical datasets and habitat information to support the development of a conceptual site model (CSM) to guide ecological risk evaluations. Based on the Phase I sediment and surface-water results, a Baseline Ecological Evaluation (BEE) was completed (see Appendix A).

The findings of the Phase I RI and the BEE were used to focus additional data collection, during the Phase II sampling conducted in December 2010. Phase II investigations were implemented to further refine the CSM and support ecological evaluations. This revised RIR presents the integrated findings of Phase I and Phase II sediment and surface-water sampling.

## 1.1 Purpose and Objectives

The overall objective of this RIR was to collect sufficient information to do the following:

- Characterize physical and chemical conditions in the Wanaque River in order to refine the existing CSM for the river.
- Evaluate potential migration pathways of site-related constituents in surface water and sediment to the Wanaque River and actual or potential receptors.
- Determine whether further evaluation or action is warranted within the river.

The purpose of this report is to present:

- Results of field surveys conducted along the river;
- Results of surface-water and sediment data collected from the river;
- The updated CSM; and
- Conclusions and recommendations based on the evaluation of the data collected.

## 1.2 Report Organization

This report is organized into the following sections:

- Section 1.0 presents the introduction and regulatory requirements.
- Section 2.0 describes the site and operational history.
- Section 3.0 describes the physical settings.
- Section 4.0 presents the remedial investigation activities.
- Section 5.0 presents the technical overview of remedial investigation.
- Section 6.0 describes the remedial investigation findings.
- Section 7.0 presents the CSM.
- Section 8.0 presents the conclusions and recommendations.
- Section 9.0 lists the references cited in this report.

## 1.3 NJDEP Document Requirements

As required by the NJTRSR [NJAC 7:26E 4.8(b)6], a case inventory document (CID), which provides the status of the individual areas of concern (AOCs) for the site, was submitted with the Northern Manufacturing Area (NMA) and Western Manufacturing Area (WMA) Remedial Investigation Reports (RIRs) (Parsons, 2010a and Parsons,



2010b). A current CID is being submitted with this revised RIR to provide information regarding the current status of identified AOCs adjacent to the Wanaque River (see Appendix B). The *Receptor Evaluation Form* and associated documentation submitted to NJDEP on February 28, 2011 remains current; therefore, no revisions to the *Receptor Evaluation Form* are being submitted with this RIR. The required NJDEP RIR form with information pertinent to the Wanaque River is presented at the front of this document.

## 2.0 Site History

The following sections provide an overview of the PLW site, including site location, operational history, and a review of available historical aerial photographs in accordance with the N.J.A.C. 7:26E-4.8. A summary of previous investigations in the Wanaque River is also provided.

### 2.1 Site Location

The PLW site encompasses 570 acres and is located in the boroughs of Pompton Lakes and Wanaque in Passaic County, New Jersey (see Figure 1). The site includes two major drainage areas: the Wanaque River (former Lake Inez) on the west and the Acid Brook on the east. The site is bordered to the northeast and east by the Ramapo State Forest (deciduous forest and some deciduous wooded wetlands), to the south by the town of Pompton Lakes (industrial, commercial/services, and residential land use) and Pompton Lake, and to the west and northwest by Twin Lake Valley (commercial/services and residential land use) and the Borough of Wanaque. Interstate 287 (I-287) crosses the northern portion of the site.

### 2.2 Operational History

Explosives manufacturing operations pre-date the DuPont operating history in the portion of the Wanaque River Valley (former Lake Inez Valley) being addressed in this RIR. As described in the 1989 CH2MHILL *Operational History, Pompton Lakes Works*, the manufacturing of explosive products can be traced back to late 1800s (CH2MHILL, 1989). Detailed histories of this area are contained in the aforementioned report, as well as the 1994 *Former Operating Area Preliminary Assessment Report* [DuPont Environmental Remediation Services (DERS), 1994]. A summary of these histories as it pertains to the project area is as follows:

- 1894 – American Smokeless Powder Company opens and begins production on property purchased from H. Julius Smith in the north/northwestern area of the Lake Inez Valley.
- 1902 – DuPont builds the Electric Exploder Company on the western side of Lake Inez and purchases the American Smokeless Powder Company plant, continuing the production of smokeless powder (trade name Ballistite).
- 1908 – DuPont purchases the Smith Blasting Cap Plant and consolidates operations to the Electric Exploder Company, which was renamed DuPont Fuze Works.
- 1926 – DuPont ceases all operations and production in the Lake Inez Valley. A pumping station is maintained to supply water to the expanding production in the adjacent Acid Brook Valley. The Fuze Works was moved to the Eastern Manufacturing Area (EMA), and smokeless powder operations were transferred to other DuPont facilities.

- 1984 – The Lake Inez dam is removed, draining the lake. The impoundment above the dam is no longer Lake Inez, and the region is now referred to as the Wanaque River Valley. The pumping station is decommissioned.

## 2.3 Historical Site Plans Aerial Photography

Historical site plans were unavailable for the period of time during which manufacturing was occurring in the WMA and NMA. DuPont obtained aerial photography for the site approximately every 10 years. Available aerial photographs post-date the manufacturing operations in the WMA and NMA. The aerial photographs are included as Appendix C of this RIR.

- 1940 Photograph – Plant operations had ceased, and the plant was decommissioned by 1926, 16 years before this photograph was taken.
- West of Wanaque River – Remnants of access roads are visible, and masonry piers are evident where the roads crossed Lake Inez. Remnants of foundations/footings are located along this road.
- East of Wanaque River – Remnants of five structures are visible in the flood plain. Additional remnants of foundations/footings are visible in the south-central portion of this parcel.
- 1951 – WMA remains unchanged. Residential development south of the WMA continues to increase.
- 1961 – A natural gas pipeline right-of-way (ROW) is now evident to the north of the NMA. Increased vegetation in lowlands obscures the view of former structures. Residential development south of the WMA continues to increase.
- 1971 – The natural gas pipeline ROW appears more pronounced. Residential development south of the WMA continues to increase.
- 1986 – Lake Inez ceases to exist. The U. S. Army Corps of Engineers (USACE) breached the dam following flooding in 1984. Residential development south of the WMA continues to increase.
  - West of Wanaque River – The entire parcel south of the natural gas pipeline has now emerged. Former shallow ponds are no longer present. Newly exposed areas appear as open fields.
  - East of Wanaque River – Increased vegetation in lowlands obscures the view of former structures. Former shallow ponds are no longer evident.
- 2006 – I-287 was constructed in the early 1990s, opening to traffic in November 1993. The interstate forms the northern bounds of WMA. Residential development south of the WMA continues to increase.
  - West of Wanaque River – Large-diameter galvanized steel piping is evident in the northern portion of this parcel. The material was left over from the construction of I-287. The material was removed in 2008. Vegetation has continued to flourish since the draining of the former Lake Inez. Former

structures are difficult to discern in this photograph. Former shallow ponds are no longer evident.

- East of Wanaque River – Increased vegetation in lowlands obscures the view of former structures.

## 2.4 Previous Surface-Water and Sediment Investigations

In April and October 1990, surface-water samples were collected from the Wanaque River at the southern portion of the site and south of the site (DERS, 1995). Unfiltered surface-water samples were analyzed for metals, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). Samples were collected from three locations that were co-located with sediment sampling locations: 501, 502, and 503. One additional location, 500, was sampled in October 1990.

The maximum concentration of mercury in surface water exceeded the freshwater benchmark concentrations at station 501 located near the downstream boundary of the site. Acetone, methylene and bis(2-ethylhexyl)phthalate were the only VOCs and SVOCs detected in surface water; all three constituents were detected at concentrations below ecological benchmark concentrations. No PAHs or PCBs were detected in surface water.

During the 1990 sampling event, co-located sediment samples were also collected from the Wanaque River. Samples were collected from the surficial layer (0 to 0.5 foot in depth) at locations 501-3, 502-3, and 503-3. Analyses included metals, VOCs, PAHs, SVOCs, and PCBs. Copper, lead, and mercury were analyzed in samples collected at these three locations and samples collected from an additional 10 locations.

In the 1990 dataset, maximum detected concentrations of copper, lead, and mercury exceeded conservative ecological benchmark concentrations for sediment. Two SVOCs, bis(2-ethylhexyl)phthalate and di-n-butyl phthalate, were detected in sediment but did not exceed the ecological benchmark concentrations. No other VOCs, SVOCs, PAHs, or PCBs were detected in sediment.

## 3.0 Physical Setting

This section describes the physical setting of the Wanaque River and surrounding areas.

### 3.1 Site Description

The PLW site is located in the boroughs of Pompton Lakes and Wanaque in central Passaic County in northern New Jersey. The PLW site is depicted on the United States Geological Survey (USGS) 7.5-minute Wanaque Quadrangle Map (see Figure 1). The northern portion of the site is located within the New Jersey Highlands Preservation Area. While the southern portion of the site and Wanaque River are located within the Highlands Planning Area.

Topography in the area is characterized as an incised river valley, with the lowest area being the Wanaque River at approximately 200 feet above mean sea level (amsl) where it bisects Lot 3. Within the former western and northern manufacturing areas, a broad floodway (500 to 700 feet wide) on either side of the river rises gradually to approximately 214 feet amsl, where it meets bedrock outcroppings. Bedrock rises abruptly to nearly 400 feet amsl on the eastern and western side of the river. Both the river valley and upland areas are heavily vegetated, with the exception of the areas immediately under the I-287 Bridge that crosses the northern portion of the site.

### 3.2 Surface-Water Features

The following sections describe the hydrologic and habitat/substrate features of the Wanaque River within the study area.

#### 3.2.1 Hydrologic Features

One of the major drainage areas of the site is the Wanaque River (former Lake Inez). The river originates from the Wanaque Reservoir north of the site and flows south through a valley characterized by steep bedrock slopes along the eastern and western banks (see Figure 1). Water flow is controlled approximately one mile upstream of PLW at the Wanaque Reservoir Raymond Dam. Valley topography is relatively flat in the immediate vicinity of the river, with the flood plain widening considerably in the northern portion of the valley. In the project area, the Wanaque River width is variable ranging from approximately 40 feet wide in the northern portion to 50 feet wide in the center of the project area to 25 feet or less in the southern area near the former dam. The river is relatively shallow with depths generally less than 2 feet. South of the site, the Wanaque River is classified by as NJDEP as trout maintenance waters (NJDEP, 2009). Approximately 1.5 miles south of the site, the Wanaque River joins with the Pequannock River.

Prior to 1984, there was a dam across the Wanaque River, located south of the southern boundary of the site and north of the Wanaque Avenue Bridge. The dam formed Lake Inez, which inundated low lying areas of the Wanaque River Valley. The USACE

removed a portion of the dam in 1984, which resulted in the draining of Lake Inez and the return of the Wanaque River to its channel.

### 3.2.2 Habitat/Substrate Features

Aquatic habitat in the Wanaque River varies from the Wanaque Reservoir upstream of the site to the confluence of the Pequannock River downstream of the site. Based on habitat characterization/substrate mapping conducted during the Phase II investigation, upstream of the site and the upper two-thirds of Reach 2 are characterized by riffle/run/pool complexes that are associated with cobble/gravel substrates across most of the channel transect (see Figure 3). Fine-grained sediment deposits in the upper portion of Reach 2 are generally limited to the channel margins, particularly in areas where flow is impeded by an obstruction. Flow in the lower third of Reach 2 is reduced by the remnants of the former dam. Within this portion of Reach 2, the channel broadens, water velocity is reduced, and sediment accumulates across the channel resulting in highly embedded substrates (see Figure 3). The area upstream of the former dam represents a zone of sediment deposition, where the most substantial deposits of fine-grained sediments have accumulated. As illustrated in Figure 3, substrate types in this area range from silt to embedded cobble/gravel.

Downstream of the former dam in Reach 3 (see Figure 4), the river generally returns to the riffle/run/pool structure observed upstream of the site. Depositional sediment features in Reach 3 are limited to the channel margins and areas where flow is impeded by an obstruction (see Figure 4).

## 3.3 Surficial and Bedrock Geology

The following sections describe the geology and hydrogeology of the Wanaque River Valley.

### 3.3.1 Geology and Hydrogeology

The site is located in the New Jersey Highlands physiographic province. The bedrock consists of various Precambrian era high-grade metamorphosed gneisses. Deposits remaining from the Wisconsin glacier make up the majority of the unconsolidated soils in the Lake Inez region. The unconsolidated soils range in thickness from a thin soil cover to where bedrock outcrops to approximately 60 feet in the valley. These soils are comprised of a poorly sorted deposit of sand, gravel, cobbles, silt, and clay (Parsons, 2010a and Parsons, 2010b).

The average annual rainfall in the vicinity of the site is 48.5 inches per year (in/yr), and groundwater in the Wanaque River Valley is encountered at a depth of between 8 and 19 feet below ground surface (bgs). The thickness of the saturated alluvial zone varies from approximately 32 feet in the mid-valley to 47 feet near the former Lake Inez dam. The groundwater flow direction in the alluvium is generally south at an approximate horizontal gradient of 0.001 feet per foot (ft/ft) (Parsons, 2010a and Parsons, 2010b).

### 3.3.2 Groundwater Quality

Groundwater studies have been conducted as part of various site investigations, including the Comprehensive Groundwater Monitoring Program (CGWMP). Groundwater investigations for the Lake Inez region were conducted at the direction of NJDEP in accordance with the August 1994 Phase I Site Investigation Work Plan (SIWP) and the CGWMP.

Based on available groundwater data from alluvial and bedrock wells located in the lower portion of the valley, it does not appear that groundwater migration is a primary contaminant migration pathway for ecological receptors in the Wanaque River. As described in Section 6.2 of the BEE, evaluation of groundwater data from these sampling programs indicated that copper was the only constituent detected above the Class IIA Groundwater Quality Criteria (GWIIA) of 1,000 µg/L; VOCs were not detected above the method detection limit (MDL). Copper was believed to be associated with copper wire found in AOC 192, which was remediated in 1996. The copper exceedance was delineated in groundwater and found to be of limited extent; it was also determined that copper was not migrating with groundwater (Parsons, 2010b). Furthermore, copper concentrations in the Wanaque River prior to the remediation of AOC 192 were below the MDL of 10 µg/L, indicating that elevated concentrations of copper in groundwater were not migrating to the river. Maximum copper concentrations in surface-water samples collected in Reach 2 during the December 2009 investigation were 1.9 µg/L and 1.6 µg/L for unfiltered and filtered samples, respectively (see Section 6.1.1). Collectively, these findings indicate that groundwater discharge is not a primary contaminant migration pathway in the WMA.

## 3.4 Land Use

Land use along the southern portion of the Wanaque River (beyond the site boundary) consists of commercial, light industrial, recreational and some residential. The Ramapo State Forest borders the site on the northeastern side, and Interstate 287 crosses the northern portion of the site

Currently, the property owned by DuPont is not used for any industrial or any other activities. As stated in Section 2.2, site activities in this area ceased in 1926. Two parcels (consisting of Block 479, Lots 3, 4, and 5) located in the furthest northern area will be donated in the future to the State of New Jersey.

## 4.0 Remedial Investigation Activities

The following sections describe the sampling approach and methodologies for the two phases of surface-water and sediment investigations conducted in the Wanaque River.

### 4.1 Phase I Investigation – December 2009

The Phase I sediment and surface-water sampling was conducted to provide a spatially adequate dataset representative of baseline conditions. Since the collection of initial surface-water and sediment data in 1990 (see Section 2.4), IRMs were completed in five on-site AOCs between November 1996 and June 2001, which included excavation/backfilling or stabilization measures. The 1990 sediment and surface-water data were collected prior to the removal and/or stabilization of adjacent upland soils that may have contributed site-related constituents to the river and, therefore, are not representative of current conditions. The following sections describe the Phase I investigation designed to collect adequate sediment and surface-water data to establish baseline analytical datasets and habitat information to support the development of the CSM for ecological investigations the Wanaque River.

#### 4.1.1 Phase I Sampling Approach and Methodology

As discussed in Section 1.0, the study area was divided into three reaches representing conditions upstream, adjacent to, and downstream of the site the study area. The spatial extent of Phase I surface-water and sediment sampling extended from the outflow of the Wanaque Reservoir at the upstream limit of Reach 1 downstream to Herschfield Park in Reach 3. Phase I surface-water and sediment stations established in each reach are summarized below:

- Reach 1: Eight stations were sampled in the upstream reach to provide adequate data for calculating a background concentration in accordance with EPA ProUCL guidance (EPA, 2007; see Figure 5).
- Reach 2: Ten stations were sampled in the reach within the property boundary; sampling stations were distributed throughout, with targeted sampling in depositional features downstream of elevated mercury concentrations found in adjacent floodplain soils (see Figure 6).
- Reach 3: Six stations were sampled downstream of the site property boundary to evaluate the extent of potential downstream COPEC migration. Reach 3 sampling stations were proposed at or near previously sampled sediment stations (see Figure 7).

Detailed descriptions of the sampling activities are provided in the following sections. Table 1 summarizes analytical samples collected during the Phase I investigation, including sample dates and analyses.



## Surface Water

Surface-water samples were collected from the center of flow adjacent to sediment sampling locations following general guidance and principles outlined in EPA *Method 1669 – Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels* (July 1996). Surface-water samples were collected from the mid-depth of the water column using a Shur-Flo Model 2088-433-344 diaphragm pump fitted with Cole Parmer C-Flex tubing. Samples were field filtered using high capacity 0.45µm in-line capsule filters. Samples were stored at 4 degrees Celsius (°C) and shipped on wet ice under proper chain-of-custody procedures to the contract laboratories. Location data for each sampling station were recorded using a Trimble GeoXH global positioning system (GPS) capable of sub-meter accuracy. *In-situ* water chemistry parameters including pH, temperature, dissolved oxygen, and conductivity were measured at mid-depth and recorded on field data sheets (see Appendix D).

## Sediment

Sediment samples were collected from fine-grained deposits within the wetted channel using a Petite Ponar dredge sampler (area = 36 in<sup>2</sup>). Collection of sediments within the fine-grained deposits represents a conservative assessment of exposure within the river, given that site-related constituents are likely concentrated in fine-grained sediments. Sampling methodology was based on general guidance and principles outlined in EPA *Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analysis: Technical Manual* (EPA, 2001) and NJDEP *Guidance for Sediment Quality Evaluations* (NJDEP, 1998). Acid volatile sulfide (AVS) and simultaneously extractable metals (SEM) samples were collected from undisturbed surficial sediments at the top of the Petite Ponar grab sample prior to homogenization of the sediments for other analyses. Sampling locations were recorded using a Trimble GEO XH GPS unit capable of sub-meter accuracy. Samples were stored at 4°C and shipped on wet ice under proper chain-of-custody procedures to the contract laboratory.

## 4.2 Phase II Investigation – November 2010

The scope of Phase II investigations in the Wanaque River was developed based on recommendations provided in the Wanaque River BEE and the initial RIR dated July 31, 2010. Phase II investigations included three primary elements:

- Additional base flow surface-water characterization
- Surficial sediment characterization
- Habitat/substrate characterization and mapping

The following sections describe the Phase II investigation conducted in November 2010 to collect additional sediment and surface-water data and habitat characterization information. Table 2 summarizes analytical samples collected during the Phase II investigation, including sample dates and analyses.

### 4.2.1 Phase II Sampling Approach and Methodology

The following sections describe sampling approach and methodologies for surface-water and sediment sampling, and habitat characterization/substrate mapping tasks included in the Phase II investigation.

#### Surface Water

Based on the findings of the Phase I surface-water sampling, the RIR and BEE recommended additional base flow surface-water characterization to further refine the CSM for potential mercury sources/transport processes. Specific objectives of additional surface-water data collection are as follows:

- Further evaluation of areas where increases in filtered and unfiltered total mercury (THg) concentrations were observed in Phase I surface-water data (WR-15 and WR-20)
- Further characterization of potential source features within Reach 2, particularly in the lower half of Reach 2 where elevated concentrations of THg were observed in sediments and adjacent floodplain/upland soils
- Evaluation of surface water downstream of river-connected riparian wetland zones to understand potential methylmercury (MeHg) export from wetlands to the river
- Further characterization of background (Reach 1) THg and MeHg concentrations in surface water concurrent with investigations in Reaches 2 and 3

Twenty-two stations were sampled in Phase II to provide additional characterization of mercury concentrations in surface water. As illustrated in Figures 5 through 7, a subset of these locations was selected for triplicate sampling to provide higher quality data for evaluation by estimating sampling variability. The selection of stations for triplicate analyses was based on sampling stations where step-change increases in filtered and unfiltered THg concentrations were observed during Phase I data collection:

- WR-14 to WR-15: Increase in filtered and unfiltered THg downstream of the former pump house; sampling transects were established in the vicinity of WR-15 to evaluate potential sources of mercury to the river from adjacent features on both banks (see Figure 6).
- WR-19 to WR-20: Increase in THg downstream of Post Brook (see Figure 7).

Additional triplicate sampling was conducted at 1) the proposed station near the upstream site boundary at station WR-08 (see Figure 5) to better quantify THg and MeHg concentrations in surface water flowing onto the site and 2) downstream of the Wilderness Island (WR-22.5) to evaluate potential THg and MeHg export from the riparian wetlands surrounding Wilderness Island (see Figure 6).

Consistent with procedures used during Phase I sampling, surface-water samples were collected from mid-depth using a diaphragm pump in accordance with EPA Method 1669. Surface-water samples were analyzed for THg and/or MeHg depending upon the station, as illustrated in Figures 5 through 7 and Table 2. Samples submitted for mercury analyses included unfiltered samples and samples filtered in the field with a high capacity

0.45 µm filter; unfiltered samples were also analyzed for total suspended solids (TSS) to quantify the concentration of mercury on particles. At each sampling station, water quality parameters including pH, temperature, dissolved oxygen, and conductivity, were measured in situ at mid-depth.

### **Sediment**

Additional characterization of surficial sediments was conducted at five locations in the lower portion of Reach 2 to further define THg concentrations adjacent to WR-17 and WR-18 (see Figure 6). Further sampling of surficial sediments proximate to these locations was conducted in Phase II to characterize the spatial extent of concentrations exceeding ecological benchmarks. Although there is no human health standard for sediment, the additional characterization was also conducted to determine the spatial extent of sediment mercury concentrations exceeding New Jersey Residential Direct Contact Soil Remediation Standard (NJRDCSRS).

Surficial sediment samples (0 to 0.5 feet) were collected from fine-grained, depositional areas upstream of the former dam adjacent to Phase I locations WR-17 and WR-18 (see Figure 6). Surficial sediment samples were collected using a Ponar dredge, consistent with the Phase I sampling approach. Sediment samples were analyzed for THg, grain size distribution and total organic carbon (TOC) content.

### **Habitat Characterization/Substrate Mapping**

Detailed substrate mapping and habitat characterization based on the EPA Rapid Bioassessment Protocol (RBP) Visual-Based Habitat Assessment were conducted in approximately 100 m reaches in representative habitats throughout Reaches 2 and 3 (see Figures 2 and 3, respectively); substrates were generally characterized in the remainder of the areas within Reaches 2 and 3. Additional mapping of floodplain features (e.g., bank disturbance) was also conducted to further identify potential source areas of mercury from adjacent upland areas.

## 5.0 Technical Overview of Remedial Investigation Activities

The following sections provide a technical overview of the Phase I and Phase II investigation in the Wanaque River, including the reliability of analytical data, significant events impacting results, and details pertaining to the survey of sampling stations. The NJDEP-required HazSite electronic data submittal (EDS) of laboratory results for Phase II is provided in Appendix E. The HazSite EDS of laboratory results for Phase I was submitted to NJDEP in the Wanaque River RIR dated July 31, 2010; the Phase I results were not re-submitted in this revised RIR to avoid duplication of sample results.

### 5.1 Reliability of Analytical Data

The following sections detail the field and laboratory analytical methods used in the collection of surface-water and sediment data. The results of data validation and a summary of quality assurance/quality control (QA/QC) procedures are also provided.

#### 5.1.1 Analytical Methods

The following section presents the laboratory and field analytical measurements collected during the Phase I and Phase II investigations. A summary of analytical methods and quality assurance indicators is provided in Table 3.

Surface-water samples collected from the Wanaque River in Phase I and II were analyzed for unfiltered and filtered THg by EPA Method 1631 at Brooks-Rand Laboratories (Seattle, WA). Phase II surface-water samples were analyzed for MeHg by EPA Method 1630 at Brooks Rand. Other metals were analyzed in Phase I using EPA Method 6010B by Lancaster Laboratories (Lancaster, PA). Unfiltered samples were analyzed by Lancaster Laboratories for total hardness (SM20 2340 C) and total suspended solids (TSS; SM20 2540 D).

Sediment samples were analyzed by Lancaster Laboratories for THg using EPA Method 7471B (Phases I and II) and other metals by EPA Method 6010B (Phase I). Samples were also analyzed in Phase I for AVS:SEM, TOC (Lloyd Kahn method), and grain size (ASTM D422) in Phases I and II.

*In-situ* water quality parameters were obtained using a YSI 556 Multi-Parameter water quality system. Daily calibration of the YSI was conducted in accordance with the specifications of the manufacturer.

#### 5.1.2 Data Validation

The DuPont Analytical Data Quality Management (ADQM) Group conducted data validation on the electronic data deliverable using the DuPont data review (DDR) process. This process reviews and evaluates laboratory data including hold time criteria, blank contamination, Matrix Spike/Matrix Spike duplicate (MS/MSD) recoveries, duplicate sample relative percent difference (RPD), and surrogate recoveries. Based on

the DDR process, the following qualifiers were assigned to the sediment and surface-water data as applicable:

Qualifier	Definition
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

The DDR reports for the Phase I and Phase II sampling events are provided in Appendix E.

The results of the DDR data review indicate that the samples were considered useable in consideration of the objectives for the RI and no significant QC exceptions were noted. Sample results were qualified due to contamination of the method blank and/or when the sample results were detected between the MDL and practical quantitation limit (PQL).

### 5.1.3 Quality Assurance/Quality Control Samples

QA/QC samples were collected with sediment and surface-water samples to help identify and minimize potential sources of sample contamination due to field procedures and to evaluate potential error introduced by sample collection and handling. QA/QC samples that collected during the sampling effort include:

- **Field Blanks:** A field blank sample was collected by rinsing laboratory demonstrated analyte-free water over decontaminated sampling equipment to evaluate potential contamination from field equipment, as well as the ambient air. Field blanks associated with sediment sampling were collected at a rate of 10 percent of the sediment samples collected throughout the sampling event, not to exceed one per day. Field blanks associated with surface-water sampling were collected at a rate of one per day.
- **Duplicates:** Field duplicate samples were collected to evaluate the performance of the laboratory and sampling team by comparing the results of two samples collected from the same location. With the exception of AVS:SEM analyses, which was collected prior to homogenization, duplicate samples were collected from the homogenized material collected at a given sampling location. Duplicate samples were collected at a rate of five percent of the total samples collected for each sampling matrix. Locations for the collection of duplicates were based on professional judgment.
- **Matrix Spikes and Matrix Spike Duplicates (MS/MSDs):** MS/MSD samples are laboratory control samples that were collected at a rate of five (5) percent of the total number of samples collected for each sampling matrix. At sampling locations where MS/MSD samples were collected, additional volume of the sampling medium was collected and shipped with the primary sample from which it was collected.

- **Temperature Blanks:** Temperature blanks were included in each sampling cooler to ensure that the appropriate sample temperature was maintained during shipment.

Tables 4 and 5 summarize the field blank QA analytical results for surface-water and sediment samples collected in Phase I and Phase II, respectively. The results for Phase I field blank samples were all reported to be non-detect, with the exception of total mercury in surface water and barium and zinc in sediment (see Table 4). Several surface-water field blanks displayed positive detections for THg in filtered and unfiltered samples, and the associated investigative samples were flagged “B” by the validator. All barium and zinc detections in sediment were greater than ten times the blank concentration and were not impacted by equipment decontamination procedures. Phase II field blank samples for surface water contained low-level detections of THg; MeHg concentrations were below the detection limits in all Phase II field blanks (see Table 5). The Phase II field blank sample for sediment was below the detection limit for THg. Duplicate samples are included with the results presented in Section 6.0.

## 5.2 Significant Events Impacting Results

The Phase I Wanaque River sediment and surface-water investigation was designed to be a one-week sampling program; however, a significant snowfall on December 8, 2009 interrupted the surface-water sampling program after completion of 19 of the scheduled 24 samples. The five remaining surface-water samples were collected on December 18, 2009. Although snowfall prevented the continuation of the surface-water sampling as planned, mean regulated flows from the USGS gauging station located at the Raymond Dam on Wanaque Reservoir remained consistent from 16 to 19 cubic feet per second (cfs) throughout the sampling event. Sediment sampling was completed from December 16 through 18, 2009 and was not impacted by the snowfall.

Phase II surface-water sampling was conducted in Reaches 1 and 2 on November 2 and 3, 2010. On November 4, 2010, a minor rainfall event occurred during surface water sampling in Reach 3. Accumulated rainfall did not influence the mean regulated flows from the USGS gauging station located at the Raymond Dam on Wanaque Reservoir, which remained consistent at 17 cfs throughout the sampling event (November 1 through 5, 2010).

## 5.3 Site Survey

Sampling stations were initially located using a Trimble Geo XH GPS unit capable of sub-meter accuracy. Position data were collected for each surface-water and sediment sampling station in the New Jersey State Plane Coordinate System 1983 (NAD83) using a Trimble Geo XH GPS. Spatial data were post-processed with differential correction in Trimble GPS Pathfinder Office version 4.10.

## 6.0 Significance of Findings

The following sections present the results of the Phase I and Phase II surface-water and sediment sampling conducted in the Wanaque River. Surface-water data for all reaches were evaluated relative to the freshwater aquatic chronic New Jersey Surface Water Quality Standards (NJSWQS) N.J.A.C. 7:9B. Surface-water data were not evaluated relative to human health criteria because the Wanaque River is not used as a drinking-water source. Sediment data for Reach 2 (Site Reach) and Reach 3 (Downstream Reach) are presented relative to the following:

- Freshwater sediment screening guidelines specified in NJDEP *Guidance for Sediment Quality Evaluations* (NJDEP, 1998)
- Background threshold values (BTV) as calculated in EPA ProUCL v. 4.0 based on Reach 1 (Upstream Reach) sediment concentrations

### 6.1 Phase I – December 2009

The findings of the Phase I surface-water and sediment investigation are presented in the following sections. Section 6.1.3 presents a summary of the BEE conducted based on the Phase I sediment and surface-water results; the complete BEE document is included as Appendix A.

#### 6.1.1 Surface Water

A total of 24 surface-water samples were collected: eight in Reach 1, 10 in Reach 2, and six in Reach 3. Four metals, barium, copper, lead, and mercury, were detected in all three site reaches in both the unfiltered and filtered fractions (see Tables 6 through 8 and Figures 8 through 10). No other constituents were detected in surface water. Maximum concentrations of these metals did not exceed NJSWQS in filtered samples; NJSWQS for these metals are only applicable to the filtered (dissolved) fraction. Mercury concentrations were substantially lower than the chronic NJSWQS at all sampling locations (see Tables 6 through 8). However, increases in filtered and unfiltered surface-water mercury concentrations were observed between stations WR-14 and WR-15 (see Figure 9) and WR-19 and WR-20 (see Figure 10). Table 9 presents a summary of the water quality data for each of the sampling locations.

#### 6.1.2 Sediment

A total of 24 sediment samples were collected; eight in Reach 1, 10 in Reach 2, and six in Reach 3. The analytical results are presented in Tables 10 through 12 and Figures 11 through 13.

Of the 10 metals detected in the depositional sediments along the Wanaque River channel margins, mercury is the primary COPEC given the frequency of detection, frequency of exceedances, and the concentrations compared to background. Concentrations of mercury within Reach 1 upgradient of the site were relatively consistent below or near the NJDEP

LEL sediment screening value. Mercury concentrations in the upper portion of Reach 2 were near the BTV and increased across the lower portion of the Reach starting at WR-13. The maximum mercury concentration (57.4 mg/kg) detected in Reach 2 was located at WR-18, which was collected from a depositional area behind the former dam. Both the BTV and the NJDEP sediment LEL value for mercury were exceeded in sediment samples collected at stations WR-13 through WR-18. The concentration of mercury in sediment decreased through Reach 3, but concentrations throughout this portion of the river remained above both BTV concentrations and the NJDEP LEL screening value. Concentrations of mercury exceeding the BTV and LEL are not indicative of the occurrence of adverse effects; however, exceedances of these values indicate that further evaluation is warranted.

Nine other metals were detected in Wanaque River sediments. In Reach 2, arsenic, beryllium, copper, lead, and zinc exceeded the BTV and NJDEP sediment LEL values; barium, cadmium, chromium, and nickel concentrations were lower than the BTV (see Table 11). Concentrations of copper, lead, and/or zinc exceeded BTV and NJDEP sediment LEL values at three locations within Reach 2; these locations also contained sediments with elevated mercury concentrations. An evaluation of the bioavailability of these divalent metals indicates that there are sufficient concentrations of acid volatile sulfides (up to 6.2  $\mu\text{mol/g}$ ) and total organic carbon (up to 60,200 mg/kg) at these locations to bind copper, lead, and zinc in the sediment matrix; therefore, these metals are not likely bioavailable to aquatic receptors (see the BEE in Appendix A for more information). Arsenic and beryllium concentrations in Reach 2 sediments were comparable to the BTV and/or NJDEP sediment LEL values (see Table 11). With the exception of mercury, the other metals detected in Reach 3 were below background and/or NJDEP sediment LEL values (see Table 12).

### 6.1.3 Baseline Ecological Evaluation Summary

Based on the Phase I surface-water and sediment data, a BEE was completed consistent with Section 7:26E-3:11 of the NJDEP TRSR (see Appendix A). The purpose of the BEE was to address potential contaminant migration pathways from upland AOCs at the PLW site to the Wanaque River and evaluate potential ecological effects to riverine biota as part of the remedial investigation process for the PLW site.

The scope of the Wanaque River BEE was an assessment to determine whether further sampling and investigation is warranted to further evaluate ecological exposure. The specific scope of work for the BEE included identifying the co-occurrence of the following:

- Site-specific COPECs
- Environmentally sensitive natural resources (ESNRs), with particular focus on the Wanaque River
- Potential contaminant migration pathways from upland AOCs to river ESNRs

The BEE evaluated the potential for impacts to Wanaque River biota through comparisons of COPEC concentrations in sediment and surface water to ecological benchmark and background concentrations. No COPECs were identified for surface



water in the Wanaque River. Only mercury was identified as a COPEC in sediment based on exceedances of both ecological sediment screening values and background concentrations.

ESNRs identified for the Wanaque River BEE include the Wanaque River and groundwater. The Wanaque River is designated by the NJDEP as trout production waters. Groundwater is evaluated only in the context of its potential ecological impacts to the Wanaque River.

Potential contaminant migration pathways to the Wanaque River include stormwater runoff, bank erosion, and other potential direct loading processes from adjacent terrestrial and floodplain areas. Scour, re-suspension, and re-deposition are in-stream processes that may facilitate migration of COPECs to downstream areas. Groundwater migration to off-site surface-water resources was not identified as a contaminant migration pathway of concern for ecological receptors.

Based on the presence of mercury above conservative screening benchmark and background concentrations, the initial BEE recommended additional characterization of mercury in sediments in Reach 2. Although site-related metals did not exceed benchmarks in Wanaque River surface-water samples collected from any of the three reaches, additional surface-water sampling was also recommended to augment the understanding of potential mercury transport and fate in the river.

## **6.2 Phase II – November 2010**

The following sections present the findings of the Phase II surface-water and sediment investigation that was designed to implement the recommendations provided in the Wanaque River BEE and the RIR dated July 31, 2010.

### **6.2.1 Surface Water**

Phase II surface-water sampling results for THg and MeHg are summarized in Table 13 (Reach 1), Table 14 (Reach 2), and Table 15 (Reach 3). As presented in Tables 13 through 15, THg concentrations in filtered and unfiltered samples were lower than the NJSWQS for chronic exposure of aquatic life (0.77 µg dissolved THg/L) at all locations sampled in Reaches 1 – 3. MeHg was detected in filtered and unfiltered surface-water samples collected from stations in all three reaches (see Tables 13 through 15). Concentrations of filtered and unfiltered MeHg in samples collected from stations in the lower section of Reach 2 were elevated relative to upstream stations (see Figure 9); however, there is currently no NJSWQS to evaluate MeHg concentrations in surface water.

The findings of the Phase II surface-water sampling further support the findings of the BEE, which indicated that concentrations of THg in surface water are not likely to result in adverse effects to aquatic life. As stated in the BEE and RIR (URS, 2010), concentrations of THg measured in filtered and unfiltered Phase I surface-water samples were below the chronic NJSWQS. In combination, the Phase I and Phase II surface-water sampling results indicated that under base flow conditions, THg concentrations in surface water do not pose an unacceptable risk to aquatic life.

### 6.2.2 Sediment

The results of the Phase II sediment characterization are summarized in Table 16 and illustrated in Figure 12 with Phase I sampling results.

Concentrations of THg in surficial sediments upstream of the former dam are consistent with sediment depositional patterns of finer-grained substrate (see Figure 3). As illustrated in Figure 14, concentrations of THg in depositional features in Reach 2 are consistent with background concentrations in the upper portion of Reach 2 (WR-09 to WR-12). Sediment THg concentrations appear to increase (relative to background concentrations) moving downstream and reach maximum concentrations in the zone of sediment deposition behind the former dam where the most substantial deposits of fine-grained sediments have accumulated (WR-17 through WR-18A and WR-18B). Downstream of the former dam, THg in surficial sediments from depositional features decrease substantially relative to concentrations upstream of the former dam (see Figure 14).

## 7.0 Conceptual Site Model

A CSM was developed for the Wanaque River based on information presented in this RIR and previous investigations. The purpose of the CSM is to assist in the evaluation of potential sources and migration pathways of site-related constituents that are present in the Wanaque River (see Figure 15). In-stream contaminant fate and transport processes for site-related constituents, particularly mercury, are also illustrated in the CSM. The following sections describe potential contaminant migration pathways to the Wanaque River and potential in-stream fate and transport processes for constituents that may have migrated to the river.

### 7.1 Potential Migration Pathways to the Wanaque River

The following subsections evaluate concentrations of site-related constituents in floodplain and upland soils adjacent to the Wanaque River and identify floodplain characteristics (e.g., eroded banks, drainages) that may represent sources and/or migration pathways to the river.

#### 7.1.1 Evaluation of Floodplain and Upland Soils

Extensive investigations of site-related constituents in upland and floodplain soils within the former manufacturing areas have been conducted as part of on-going remedial investigations of the PLW. Detailed descriptions of these investigations have been reported in RIRs submitted to NJDEP and EPA (Parsons, 2010a and Parsons, 2010b). BEEs submitted as part of these RIRs identified site-related metals as the primary COPECs in surficial soils based on comparisons of measured concentrations to ecological benchmark concentrations for soil (Parsons, 2010a and Parsons, 2010b).

In the NMA, six metals (arsenic, copper, lead, mercury, selenium, and zinc) and high molecular weight (HMW) PAHs were identified as COPECs in surficial soils; lead was identified as the primary COPEC in NMA soils based on the frequency and magnitude of exceedances of ecological benchmark concentrations and ambient soil concentrations.

The WMA BEE identified multiple metals and HMW PAHs as COPECs in surficial soils (Parsons, 2010b). Of these COPECs, mercury, copper, and lead were reported in the greatest concentrations relative to ecological benchmark concentrations. Mercury concentrations in surficial soils were greatest in the areas adjacent to the lower section of Reach 2: Southwest Lake Inez Upland Area (AOC 109) and southern portions of the Wanaque River floodplain (AOC 113 opposite AOC 109). Mercury concentrations were lowest in soil in the upper section of Reach 2: the Magazine Area, the Northwest Lake Inez Uplands and the northern portion of the Wanaque River floodplain (see Figure 16).

In addition to investigations of soils within the former manufacturing areas, extensive investigations and remediation of floodplain soils have been conducted in off-site areas downstream of the site (DERS, 1995). From 1990 to 1992, characterization sampling of off-site surface and subsurface soils was conducted in the Wanaque River floodplain from the downstream site boundary to the confluence of the Pequannock River. The

findings of the investigation indicated that lead and mercury exceedances were confined to the upper 24 inches of soil at select locations within the 100-year floodplain. A total of 15 remedial projects were completed off-site to remove soils exceeding remediation criteria. These projects resulted in the removal of approximately six acres of the Wanaque River floodplain, which were replaced with clean fill.

In summary, site-related metals are the primary constituents of concern. Of the site-related metals, mercury, copper, and lead were measured at the greatest concentrations in surficial upland and floodplain soils relative to ecological benchmark and ambient soil concentrations.

### **7.1.2 Floodplain Characteristics**

A qualitative habitat survey was conducted as part of site reconnaissance efforts in November 2009, and habitat characterization/substrate mapping was conducted in November 2010 to evaluate potential sources and migration pathways of COPECs to the river. The surveys identified floodplain characteristics, including eroding banks, drainage channels, or other disturbances that may be important features in potential transport pathways from adjacent upland and floodplain areas.

Mapping of floodplain features in Reach 2 indicates that most disturbances are located in the upper portion of the reach. As illustrated in Figure 16, eroded banks were limited to the upstream sections of the river and were consistent with numerous bends in the river (see Photographic Log in Appendix F). Stream banks in the lower section of Reach 2 were predominantly vegetated and stable; no significant bank erosion was documented. Other bank disturbances included all-terrain vehicle (ATV) crossings, which were generally limited to the middle and upper portion of Reach 2.

The location of bank disturbances is relevant to conceptual migration pathways of COPECs from adjacent floodplain and upland soils to the river. As described in the WMA RIR (Parsons, 2010b), concentrations of COPECs, particularly mercury, in adjacent floodplain and upland soil samples were generally greatest in the lower portion of Reach 2. The conditions of stream banks in the lower portion of Reach 2 suggest that there is stability of floodplain soils in this area.

### **7.1.3 Vadose Zone Interflow**

As discussed in Section 3.3.2, existing data indicate that contaminant migration via the alluvial aquifer is not a complete transport pathway.

### **7.1.4 Regional Contribution**

COPECs may be transported to the Wanaque River through regional migration pathways, including atmospheric deposition and contributions from upstream sources within the watershed. Recent data indicate that the mercury deposition rate from atmospheric sources in northern New Jersey is approximately 10.1  $\mu\text{g}/\text{m}^2/\text{yr}$  (National Atmospheric Deposition Program, 2008); however, sediment records from New Jersey lakes indicate that atmospheric deposition may have been higher historically (Kroenke et al., 2002). Mercury from atmospheric and other upstream sources within the watershed may be

transported downstream into the study area. Sediment and surface-water data from Reach 1 provide an estimate of these regional contributions of mercury and other COPECs from upstream sources.

## 7.2 Potential In-Stream Fate and Transport Processes

The following sections describe substrate characteristics and in-stream processes that may influence the fate and transport of COPECs introduced the Wanaque River.

### 7.2.1 Sediment Deposition

As described in Section 3.2, aquatic habitat in the Wanaque River varies within the reach that traverses the site (Reach 2) based on changing sediment depositional patterns. In the upper two thirds of Reach 2 (on-site), the river is characterized by riffle/run/pool complexes that are associated with coarse-grained substrates (cobble, gravel, and sand) across most of the channel transect; fine-grained sediment deposits in this reach are generally limited to the channel margins, particularly in areas where flow is impeded by an obstruction. Flow in the lower third of the on-site reach is reduced by the remnants of the former dam. In this reach, the channel broadens, water velocity is reduced, and sediment accumulates across the channel resulting in fine-grained sediment deposits and highly embedded substrates. Downstream of the former dam, the river returns to the riffle/run/pool structure observed upstream of the site. Depositional sediment features downstream of the former dam are limited to the channel margins and in areas where flow is impeded by an obstruction. With the exception of the zone of sediment deposition upstream of the former dam, fine-grained sediment deposits represent a relatively minor component (approximately 5 to 10 percent) of overall habitat availability in Reaches 2 and 3.

Depositional patterns within the Wanaque River determine the potential ecological receptors and relative exposure to site-related constituents in sediment. The richest target habitats for benthic invertebrate communities in the river are associated with riffle/run features characterized by predominately coarse-grained substrates and relatively limited fine-grained sediment deposits. Coarse-grained substrates in riffle/run features typically support greater invertebrate abundance and diversity compared to fine-grained deposits located along the channel margins and in backwater areas created by flow obstructions.

Exposure to ecological receptors inhabiting fine-grained sediment deposits is generally greater due to the capacity of fine-grained sediments to retain mercury and other metal COPECs. Based on bulk sediment analyses, lower THg concentrations would be expected in coarse-grained substrates relative to fine-grained substrates. As a result, benthic communities inhabiting the fine-grained habitats are typically exposed to greater COPEC concentrations compared to communities inhabiting coarse-grained deposits. The zone of deposition upstream of the former dam represents the largest spatial extent of fine-grained sediment deposits and the greatest concentrations of mercury and other COPECs in sediments within Reaches 2 and 3; therefore, this fine-grained deposit represents the area of greatest potential ecological exposure within the study area.

### 7.2.2 In-Stream Processes

Watershed and in-stream characteristics influence the fate and transport of COPECs, particularly mercury, the primary constituent of concern in the Wanaque River. Mercury methylation is an important component of the fate and transport of mercury in aquatic systems (Benoit et al., 2003). Mercury methylation is a biochemical reaction where inorganic species of mercury are methylated by anaerobic bacteria, including sulfate-reducing (Compeau and Bartha, 1985) and iron-reducing bacteria (Fleming et al., 2006) in anoxic or suboxic regions of aquatic systems. MeHg has different chemical, physical, and toxicological properties compared to inorganic mercury; therefore, the form of mercury present in the environment is an important consideration in the evaluation of ecological risk.

In a fluvial system, in-stream areas where mercury methylation could potentially occur include fine-grained sediment deposits located within the channel or the hyporheic zone (Stoor et al., 2006). Fine-grained sediment deposits provide favorable geochemical conditions for methylation but may be limited as MeHg loading sources by small surface areas available for diffusion. The hyporheic zone may also be an important source of MeHg to aquatic systems due to a high surface area. In adjacent floodplain areas, wetlands are generally thought to provide favorable geochemical conditions for methylation (organic carbon, anoxic or suboxic sediment, and electron acceptors), but are limited as a source of MeHg to rivers by low hydraulic connectivity.

Evaluation of Phase II surface-water data indicates that MeHg is present throughout the study area and that increased mercury methylation may be associated with fine-grained sediment deposits upstream of the former dam. MeHg was detected in filtered and unfiltered surface-water samples collected from stations in Reach 1 upstream of the site and stations in the upper section of Reach 2. Coincident with the zone of fine-grained sediment deposition upstream of the former dam, concentrations of filtered and unfiltered MeHg in samples collected from stations in the lower section of Reach 2 were elevated relative to upstream stations. Increased MeHg concentrations in surface-water samples collected from the lower section of Reach 2 may be indicative of mercury methylation in fine-grained sediment deposits upstream of the former dam.

## 7.3 Conceptual Site Model Summary

Evaluation of the CSM indicates that the primary contaminant transport pathway from former site operations to the Wanaque River is likely historical migration from the adjacent uplands and floodplain. The stable condition of the banks and vegetated adjacent floodplains that currently exist in Reach 2 suggests that the accumulation of particulate-bound COPECs in Reach 2 upstream of the former dam in Reach 2 was predominately associated with historical migration pathways during a period of less soil stability.

When introduced to the river, particulate-bound COPECs were deposited primarily in the area of low water velocity created by the former dam. Elevated concentrations of COPECs observed in sediment between sampling station WR-16, and the remnants of the former dam are likely attributed to the accumulation of these historically-released fine-grained sediments upstream of the former dam. This fine-grained deposit represents the area of greatest potential ecological exposure due to the elevated concentrations of

COPECs and the potential for mercury methylation. In addition, mercury concentrations in sediment downstream of WR-16 to the former dam exceed the NJRDCSRS.

Downstream of the former dam in Reach 3, sediment depositional features are limited as the river returns to the riffle/run/pool structure observed upstream of the site. Fine-grained sediment deposits in this reach are generally limited to the channel margins and areas downstream of obstructions. Consistent with the change in sediment depositional patterns, concentrations of COPECs in sediments decrease substantially relative to concentrations observed immediately upstream of the former dam; this decrease in sediment COPEC concentrations results in reduced ecological exposure relative to the fine-grained sediment deposit upstream of the former dam.

## 8.0 Conclusions and Recommendations

The Phase I and II sediment and surface-water investigations provide an adequate characterization of baseline conditions in the Wanaque River upstream, adjacent to, and downstream of the PLW site. The following sections present the conclusions of the Phase I and II investigations and provide recommendations for further action in the Wanaque River.

### 8.1 Conclusions

The results of Phase I and II sediment and surface-water investigations in the Wanaque River support the following conclusions:

- Given the frequency of detection, frequency of exceedances, and elevated concentrations, mercury is the primary sediment COPEC in the Wanaque River adjacent to and downstream of the PLW site.
- The primary contaminant transport pathway from former site operations to the Wanaque River is likely historical migration from the adjacent uplands and floodplain. The current conditions of river banks and floodplain/upland areas adjacent to Reach 2 are stable and vegetated, which limits the mobilization of particulate-bound COPECs to the river.
- Surface-water concentrations of filtered and unfiltered THg and other site-related metals are below chronic surface-water criteria for the protection of aquatic life (i.e., NJSWQS, NRWQC); therefore, no unacceptable risks to aquatic life are identified for surface-water exposure.
- Mercury concentrations in sediment in the lower portion of Reach 2 (within a zone of sediment deposition downstream of WR-16 to the former dam) increased in relation to upstream samples within Reach 1 and 2 and then decreased substantially in the spatially limited depositional features downstream of the former dam (Reach 3).
- With the exception of the zone of sediment deposition immediately upstream of the former dam, fine-grained sediment deposits represent a relatively minor component (approximately 5 to 10 percent) of overall habitat availability in Reaches 2 and 3.

### 8.2 Recommendations

Based on the integrated findings of the Phase I and Phase II investigations in the Wanaque River, it is recommended that an Interim Remedial Measure (IRM) be implemented consistent with the *NJDEP Technical Requirements for Site Remediation* (7:26E-1.12) to mitigate potential human health and ecological exposure to mercury in depositional sediments in Reach 2 downstream of WR-16 to the former dam. Consistent with this recommendation, an IRM work plan will be submitted to address mercury



concentrations elevated above NJRDCSRS within 60 days of NJDEP approval of this RIR.

## 9.0 References

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## Tables

**Table 1**  
**Summary of Phase I Sampling Program**  
**Wanaque River Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Matrix	Sample Station	Date	Analysis
Sediment	WR-01	12/16/2009	Metals, Mercury, AVS:SEM, TOC, Grain Size
	WR-02	12/16/2009	
	WR-03	12/16/2009	
	WR-04	12/16/2009	
	WR-05	12/16/2009	
	WR-06	12/16/2009	
	WR-06	12/16/2009	
	WR-07	12/16/2009	
	WR-08	12/16/2009	
	WR-09	12/16/2009	
	WR-10	12/16/2009	
	WR-11	12/16/2009	
	WR-12	12/16/2009	
	WR-13	12/18/2009	
	WR-14	12/17/2009	
	WR-15	12/17/2009	
	WR-16	12/17/2009	
	WR-17	12/17/2009	
	WR-18	12/17/2009	
	WR-18	12/17/2009	
	WR-19	12/17/2009	
	WR-20	12/17/2009	
	WR-21	12/17/2009	
	WR-22	12/17/2009	
	WR-23	12/17/2009	
	WR-24	12/17/2009	
Surface Water	WR-01	12/7/2009	Total and Dissolved Metals and Mercury, TSS, Total Hardness
	WR-02	12/7/2009	
	WR-03	12/7/2009	
	WR-04	12/7/2009	
	WR-05	12/7/2009	
	WR-06	12/7/2009	
	WR-07	12/7/2009	
	WR-08	12/7/2009	
	WR-08	12/7/2009	
	WR-09	12/7/2009	
	WR-10	12/18/2009	
	WR-11	12/18/2009	
	WR-12	12/18/2009	
	WR-13	12/18/2009	
	WR-14	12/18/2009	
	WR-15	12/8/2009	
	WR-15	12/8/2009	
	WR-15	12/8/2009	
	WR-16	12/8/2009	
	WR-17	12/8/2009	
	WR-18	12/8/2009	
	WR-19	12/8/2009	
	WR-20	12/8/2009	
	WR-21	12/8/2009	
	WR-22	12/8/2009	
	WR-23	12/8/2009	
	WR-24	12/8/2009	

**Table 2**  
**Summary of Phase II Sampling Program**  
**Wanaque River Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Sample Station	Date Sampled	Sample Medium	Surface Water Analyses				Sediment Analyses		
			Total Mercury (THg)	Methylmercury (MeHg)	Total Suspended Solids (TSS)	Triplicate Samples Collected?	Total Mercury	Total Organic Carbon (TOC)	Grain Size
WR-01	11/2/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-08	11/2/2010	Surface Water - Unfiltered	●	●	●	Yes			
		Surface Water - Filtered	●	●					
WR-10.5	11/3/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-12	11/3/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-13.5	11/3/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-14	11/3/2010	Surface Water - Unfiltered	●	●	●	Yes			
		Surface Water - Filtered	●	●					
WR-14.5L	11/3/2010	Surface Water - Unfiltered	●		●	Yes			
		Surface Water - Filtered	●						
WR-14.5M	11/3/2010	Surface Water - Unfiltered	●		●	Yes			
		Surface Water - Filtered	●						
WR-14.5R	11/3/2010	Surface Water - Unfiltered	●		●	Yes			
		Surface Water - Filtered	●						
WR-15L	11/3/2010	Surface Water - Unfiltered	●		●	Yes			
		Surface Water - Filtered	●						
WR-15M	11/3/2010	Surface Water - Unfiltered	●		●	Yes			
		Surface Water - Filtered	●						
WR-15R	11/3/2010	Surface Water - Unfiltered	●		●	Yes			
		Surface Water - Filtered	●						
WR-16	11/3/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-17	11/3/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-18	11/3/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-19.5	11/4/2010	Surface Water - Unfiltered	●	●	●	Yes			
		Surface Water - Filtered	●	●					
PB-01	11/4/2010	Surface Water - Unfiltered	●	●	●	Yes			
		Surface Water - Filtered	●	●					
WR-20	11/4/2010	Surface Water - Unfiltered	●	●	●	Yes			
		Surface Water - Filtered	●	●					
WR-20.5	11/4/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-22.5	11/4/2010	Surface Water - Unfiltered	●	●	●	Yes			
		Surface Water - Filtered	●	●					
WR-23	11/4/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-24.5	11/4/2010	Surface Water - Unfiltered	●	●	●	No			
		Surface Water - Filtered	●	●					
WR-17A	11/5/2010	Sediment					●	●	●
WR-17B	11/5/2010	Sediment					●	●	●
WR-17C	11/5/2010	Sediment					●	●	●
WR-18A	11/5/2010	Sediment					●	●	●
WR-18B	11/5/2010	Sediment					●	●	●

**Table 3**  
**Analytical Methods and Quality Assurance Indicators**  
**Wanaque River Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Matrix	Analytes	Analytical Method	Sample Size/Container	Preservative	Holding Time
Sediment	THg	USEPA SW-846-7471B	250 ml glass	None	28 Days
	Metals	USEPA SW-846-6010B	250 ml glass	None	6 Months
	SEM	USEPA SW-846-6010B	250 ml glass	None	6 Months
	AVS	USEPA 821-R-91-100	125 ml glass jar	None	14 Days
	TOC	Lloyd Kahn	250 ml glass	None	14 Days
	Grain size	ASTM D422	500 ml glass	None	None
Surface Water	THg <sup>1</sup>	USEPA 1631	250 ml plastic	None	28 Days
	Metals <sup>1</sup>	USEPA SW-846-6010B	500 ml plastic	HNO <sub>3</sub>	6 Months
	TSS	SM20 2540 D	500 ml plastic	None	7 Days
	Hardness	SM20 2340 C	250 ml plastic	HNO <sub>3</sub>	6 Months

**Notes:**

THg: Total mercury

Metals: Antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, zinc.

AVS: Acid volatile sulfides

SEM: Simultaneously extracted metals

TOC: Total organic carbon

TSS: Total suspended solids

USEPA: United States Environmental Protection Agency

ASTM: American Society for Testing and Materials

SM: Standard Methods

1: Analytes measured in both filtered and unfiltered samples

Table 4  
Summary of Phase I QA/QC Samples  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Surface Water											
Analyte	Units	Dissolved(D) / Total (T)	FBLK-01			FBLK-02			FBLK-03		
			Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS											
ANTIMONY	UG/L	D		9.7	U		9.7	U		9.7	U
ANTIMONY	UG/L	T		9.7	U		9.7	U		9.7	U
ARSENIC	UG/L	D		7.2	U		7.2	U		7.2	U
ARSENIC	UG/L	T		7.2	U		7.2	U		7.2	U
BARIUM	UG/L	D		0.6	U		0.6	U		0.6	U
BARIUM	UG/L	T		0.6	U		0.6	U		0.6	U
BERYLLIUM	UG/L	D		1.4	U		1.4	U		1.4	U
BERYLLIUM	UG/L	T		1.4	U		1.4	U		1.4	U
CADMIUM	UG/L	D		0.2	U		0.2	U		0.2	U
CADMIUM	UG/L	T		0.2	U		0.2	U		0.2	U
CHROMIUM	UG/L	D		3.4	U		3.4	U		3.4	U
CHROMIUM	UG/L	T		3.4	U		3.4	U		3.4	U
COPPER	UG/L	D		0.38	U		0.38	U		0.38	U
COPPER	UG/L	T		0.38	U		0.38	U		0.38	U
LEAD	UG/L	D		0.05	U		0.05	U		0.05	U
LEAD	UG/L	T		0.05	U		0.05	U		0.05	U
MERCURY	UG/L	D	0.00029		J	0.0004			0.00019		J
MERCURY	UG/L	T		0.00015	U	0.00028		J	0.00062		
NICKEL	UG/L	D		1.8	U		1.8	U		1.8	U
NICKEL	UG/L	T		1.8	U		1.8	U		1.8	U
SELENIUM	UG/L	D		0.99	U		0.99	U		0.99	U
SELENIUM	UG/L	T		0.99	U		0.99	U		0.99	U
SILVER	UG/L	D		2.3	U		2.3	U		2.3	U
SILVER	UG/L	T		2.3	U		2.3	U		2.3	U
THALLIUM	UG/L	D		14	U		14	U		14	U
THALLIUM	UG/L	T		14	U		14	U		14	U
ZINC	UG/L	D		8.1	U		8.1	U		8.1	U
ZINC	UG/L	T		8.1	U		8.1	U		8.1	U
OTHER PARAMETERS											
TOTAL HARDNESS AS CaCO3	MG/L	T		1000	U		1000	U		1000	U
TOTAL SUSPENDED SOLIDS	MG/L	T		3000	U		3000	U		3000	U
Sediment											
METALS											
ANTIMONY	UG/L	T		9.7	U		9.7	U		9.7	U
ARSENIC	UG/L	T		7.2	U		7.2	U		7.2	U
BARIUM	UG/L	T	1.9		J	2.8		J		0.6	U
BERYLLIUM	UG/L	T		1.4	U		1.4	U		1.4	U
CADMIUM	UG/L	T		2	U		2	U		2	U
CHROMIUM	UG/L	T		3.4	U		3.4	U		3.4	U
COPPER	UG/L	T		2.7	U,J		2.7	U,J		2.7	U
LEAD	UG/L	T		6.9	U		6.9	U		6.9	U
MERCURY	UG/L	T		0.056	U		0.056	U		0.056	U
NICKEL	UG/L	T		1.8	U		1.8	U		1.8	U
SELENIUM	UG/L	T		8.9	U		8.9	U		8.9	U
SILVER	UG/L	T		2.3	U		2.3	U		2.3	U
THALLIUM	UG/L	T		14	U		14	U		14	U
ZINC	UG/L	T	8.7		J	16.4		J		8.1	U
SEM/AVS											
MERCURY	UMOL/G	T		0.000312	UJ		0.000312	UJ		0.000312	UJ
SILVER	UMOL/G	T		0.000787	R		0.000787	R		0.000787	R
CADMIUM	UMOL/G	T		0.000725	UJ		0.000725	UJ		0.000725	UJ
COPPER	UMOL/G	T		0.0000086	R		0.0000086	R		0.0000086	R
LEAD	UMOL/G	T		0.000766	UJ		0.000766	UJ		0.000766	UJ
NICKEL	UMOL/G	T		0.000417	R		0.000417	R		0.000417	R
ZINC	UMOL/G	T		0.00252	UJ		0.00252	UJ		0.00252	UJ
SEM	UMOL/G	T		0.0055356	U		0.0055356	U		0.0055356	U
ACID VOLATILE SULFIDE	UMOL/G	T		0.63	U		0.63	U		0.63	U
OTHER PARAMETERS											
TOTAL ORGANIC CARBON	MG/KG	T		500	U		500	U		500	U

**Notes:**  
ug/L - microgram per liter  
mg/L - milligrams per liter  
umol/g - micromole per gram  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in the laboratory or field blanks.  
UJ - Not detected. Reporting limit may not be accurate or precise.  
R - Unusable result. Analyte may or may not be present in the sample.



**Table 5**  
**Summary of Phase II QA/QC Samples**  
**Wanaque River Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Surface Water														
Analyte	Units	Dissolved(D) / Total (T)	FBLK-01			FBLK-02			FBLK-03			FBLK-04		
			Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS														
MERCURY	UG/L	D	0.0003		J	0.0008			0.0007					
MERCURY	UG/L	T		0.00015	U	0.0003		J	0.0005					
METHYL MERCURY	UG/L	D		0.00002	U		0.00002	U		0.00002	U			
METHYL MERCURY	UG/L	T		0.00002	U		0.00002	U		0.00002	U			
OTHER PARAMETERS														
TOTAL SUSPENDED SOLIDS	UG/L	T		300	U		600	J		400	UJ			
Sediment														
METALS														
MERCURY	MG/L	T											0.000056	U
OTHER PARAMETERS														
TOTAL ORGANIC CARBON	MG/L	T										0.7		J

Notes:

ug/L - microgram per liter

mg/L - milligrams per liter

U - not detected

J - Analyte present. Reported value may not be accurate or precise.

UJ - Not detected. Reporting limit may not be accurate or precise.

Table 6  
Summary of Phase I Surface-Water Analytical Results - Reach 1  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved(D)/Total (T)	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJSWQS <sup>1</sup>	WR-01			WR-02			WR-03			WR-04			WR-05		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																						
ANTIMONY	UG/L	D	9	0	0	0	80		9.7	U		9.7	U		9.7	U		9.7	U		9.7	U
ANTIMONY	UG/L	T	9	0	0	0	80		9.7	U		9.7	U		9.7	U		9.7	U		9.7	U
ARSENIC	UG/L	D	9	0	0	0	150		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U
ARSENIC	UG/L	T	9	0	0	0	NA		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U
BARIUM	UG/L	D	9	9	9.3	10.6	220	9.3			10.4			10.4			10.4			10.6		
BARIUM	UG/L	T	9	9	10.7	13.5	NA	13.5			13.2			12			12			12.6		
BERYLLIUM	UG/L	D	9	0	0	0	3.6		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U
BERYLLIUM	UG/L	T	9	0	0	0	3.6		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U
CADMIUM	UG/L	D	9	0	0	0	0.118		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U
CADMIUM	UG/L	T	9	0	0	0	0.181		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U
CHROMIUM	UG/L	D	9	0	0	0	15.3		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U
CHROMIUM	UG/L	T	9	0	0	0	55.2		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U
COPPER	UG/L	D	9	9	0.95	1.2	5.3	1		J	0.95		J	1		J	1.2		J	1.1		J
COPPER	UG/L	T	9	9	1.2	3.3	5.9	3.3			2.1			1.8		J	1.7		J	1.7		J
LEAD	UG/L	D	9	6	0.056	0.15	5.4		0.05	U	0.057		J		0.05	U	0.056		J	0.15		J
LEAD	UG/L	T	9	9	0.25	1.5	NA	1.5			0.82		J	0.7		J	0.64		J	0.89		J
MERCURY	UG/L	D	9	9	0.00112	0.00261	0.77	0.00209			0.00195			0.00173			0.00162			0.00261		
MERCURY	UG/L	T	9	9	0.00295	0.057	NA	0.057			0.0154			0.0115			0.0104			0.00978		
NICKEL	UG/L	D	9	0	0	0	27.9		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U
NICKEL	UG/L	T	9	0	0	0	33		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U
SELENIUM	UG/L	D	9	0	0	0	4.61		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U
SELENIUM	UG/L	T	9	0	0	0	5		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U
SILVER	UG/L	D	9	0	0	0	0.12		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U
SILVER	UG/L	T	9	0	0	0	0.12		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U
THALLIUM	UG/L	D	9	0	0	0	10		14	U		14	U		14	U		14	U		14	U
THALLIUM	UG/L	T	9	0	0	0	10		14	U		14	U		14	U		14	U		14	U
ZINC	UG/L	D	9	0	0	0	71.8		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U
ZINC	UG/L	T	9	0	0	0	75.6		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U
OTHER PARAMETERS																						
TOTAL HARDNESS AS CaCO3	MG/L	T	9	8	45.2	64.6	--	45.2			57.6			57.2			58			58.7		
TOTAL SUSPENDED SOLIDS	MG/L	T	9	6	3.2	9.2	--	6.4		J	6.4		J	5.6		J	5.2		J	9.2		J

**Notes:**  
ug/L - microgram per liter  
mg/l - milligram per liter  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in lab or field blanks.  
NA- Criterion for constituent based on the dissolved fraction.  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standards, Chronic FW2 Criteria  
1) The ecological screening value for cadmium, chromium, copper, nickel, and zinc were adjusted for hardness by using an average hardness of 58.1.

Table 6  
Summary of Phase I Surface-Water Analytical Results - Reach 1  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved(D)/Total (T)	WR-06			WR-07			WR-08			WR-08-DUP		
			Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS														
ANTIMONY	UG/L	D		9.7	U		9.7	U		9.7	U		9.7	U
ANTIMONY	UG/L	T		9.7	U		9.7	U		9.7	U		9.7	U
ARSENIC	UG/L	D		7.2	U		7.2	U		7.2	U		7.2	U
ARSENIC	UG/L	T		7.2	U		7.2	U		7.2	U		7.2	U
BARIUM	UG/L	D	10.2			10.2			10.4			10.2		
BARIUM	UG/L	T	10.9			10.8			10.7			11.2		
BERYLLIUM	UG/L	D		1.4	U		1.4	U		1.4	U		1.4	U
BERYLLIUM	UG/L	T		1.4	U		1.4	U		1.4	U		1.4	U
CADMIUM	UG/L	D		0.2	U		0.2	U		0.2	U		0.2	U
CADMIUM	UG/L	T		0.2	U		0.2	U		0.2	U		0.2	U
CHROMIUM	UG/L	D		3.4	U		3.4	U		3.4	U		3.4	U
CHROMIUM	UG/L	T		3.4	U		3.4	U		3.4	U		3.4	U
COPPER	UG/L	D	0.99		J	1		J	0.98		J	1.1		J
COPPER	UG/L	T	1.2		J	1.4		J	1.2		J	1.2		J
LEAD	UG/L	D	0.15		J	0.057		J		0.05	U	0.059		J
LEAD	UG/L	T	0.25		J	0.37		J	0.33		J	0.39		J
MERCURY	UG/L	D	0.00126		B	0.00128		B	0.0012		B	0.00112		B
MERCURY	UG/L	T	0.00343			0.00379			0.00315			0.00295		
NICKEL	UG/L	D		1.8	U		1.8	U		1.8	U		1.8	U
NICKEL	UG/L	T		1.8	U		1.8	U		1.8	U		1.8	U
SELENIUM	UG/L	D		0.99	U		0.99	U		0.99	U		0.99	U
SELENIUM	UG/L	T		0.99	U		0.99	U		0.99	U		0.99	U
SILVER	UG/L	D		2.3	U		2.3	U		2.3	U		2.3	U
SILVER	UG/L	T		2.3	U		2.3	U		2.3	U		2.3	U
THALLIUM	UG/L	D		14	U		14	U		14	U		14	U
THALLIUM	UG/L	T		14	U		14	U		14	U		14	U
ZINC	UG/L	D		8.1	U		8.1	U		8.1	U		8.1	U
ZINC	UG/L	T		8.1	U		8.1	U		8.1	U		8.1	U
OTHER PARAMETERS														
TOTAL HARDNESS AS CaCO3	MG/L	T	59.9			63.5			64.6				64	
TOTAL SUSPENDED SOLIDS	MG/L	T	3.2		J		3	U		3	U		3	U

Notes:

ug/L - microgram per liter

mg/l - milligram per liter

U - not detected

J - Analyte present. Reported value may not be accurate or precise.

B - Not detected substantially above the level reported in lab or field blanks.

NA- Criterion for constituent based on the dissolved fraction.

Mercury analysis using USEPA Method 1631

NJSWQS - New Jersey Surface Water Quality Standards, Chronic FW2 Criteria

1) The ecological screening value for cadmium, chromium, copper, nickel, and zinc were adjusted for hardness by using an average hardness of 58.1.

Table 7  
Summary of Phase I Surface-Water Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved (D)/Total (T)	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJSWQS <sup>1</sup>	WR-09			WR-10			WR-11			WR-12			WR-13			
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	
METALS																							
ANTIMONY	UG/L	D	11	0	0	0	80		9.7	U		9.7	U		9.7	U		9.7	U		9.7	U	
ANTIMONY	UG/L	T	11	0	0	0	80		9.7	U		9.7	U		9.7	U		9.7	U		9.7	U	
ARSENIC	UG/L	D	11	0	0	0	150		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U	
ARSENIC	UG/L	T	11	0	0	0	NA		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U	
BARIUM	UG/L	D	11	11	10.2	11.4	220	10.2			11.2			10.8			10.7			10.7			
BARIUM	UG/L	T	11	11	10.6	13.1	NA	10.6			11.8			11.6			13.1			11.3			
BERYLLIUM	UG/L	D	11	0	0	0	3.6		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U	
BERYLLIUM	UG/L	T	11	0	0	0	3.6		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U	
CADMIUM	UG/L	D	11	0	0	0	0.118		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U	
CADMIUM	UG/L	T	11	0	0	0	0.181		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U	
CHROMIUM	UG/L	D	11	0	0	0	15.3		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U	
CHROMIUM	UG/L	T	11	0	0	0	55.2		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U	
COPPER	UG/L	D	11	11	0.83	1.6	5.3	0.89		J	0.9		B	1.6		B	0.92		B	0.83		B	
COPPER	UG/L	T	11	11	1.1	1.9	5.9	1.2		J	1.1		B	1.1		B	1.1		B	1.1		B	
LEAD	UG/L	D	11	7	0.058	0.13	5.4	0.064		J	0.082		B		0.05	U		0.05	U		0.05	U	
LEAD	UG/L	T	11	11	0.18	0.83	NA	0.28		J	0.31		B	0.83		B	0.18		B	0.2		B	
MERCURY	UG/L	D	11	11	0.00093	0.00382	0.77	0.00125		B	0.00093		B	0.00107		B	0.00095		B	0.00108		B	
MERCURY	UG/L	T	11	11	0.00227	0.0558	NA	0.00237			0.00305		B	0.00227		B	0.0024		B	0.00453			
NICKEL	UG/L	D	11	0	0	0	27.9		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U	
NICKEL	UG/L	T	11	0	0	0	33		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U	
SELENIUM	UG/L	D	11	0	0	0	4.61		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U	
SELENIUM	UG/L	T	11	0	0	0	5		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U	
SILVER	UG/L	D	11	0	0	0	0.12		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U	
SILVER	UG/L	T	11	0	0	0	0.12		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U	
THALLIUM	UG/L	D	11	0	0	0	10		14	U		14	U		14	U		14	U		14	U	
THALLIUM	UG/L	T	11	0	0	0	10		14	U		14	U		14	U		14	U		14	U	
ZINC	UG/L	D	11	0	0	0	71.8		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U	
ZINC	UG/L	T	11	0	0	0	75.6		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U	
OTHER PARAMETERS																							
TOTAL HARDNESS AS CaCO3	MG/L	T	11	11	62.1	66.1	--	63.7			64.3			66.1			63.5			63.1			
TOTAL SUSPENDED SOLIDS	MG/L	T	11	5	3.6	4.4	--			3	U		3	U		3	U		3	U		3	U

**Notes:**  
ug/L - microgram per liter  
mg/l - milligram per liter  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
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NA- Criterion for constituent based on the dissolved fraction.  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standards, Chronic FW2 Criteria  
1) The ecological screening value for cadmium, chromium, copper, nickel, and zinc were adjusted for hardness by using an average hardness of 63.8.

Table 7  
Summary of Phase I Surface-Water Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved (D)/Total (T)	WR-14			WR-15			WR-15-DUP			WR-16			WR-17			WR-18		
			Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																				
ANTIMONY	UG/L	D		9.7	U		9.7	U		9.7			9.7	U		9.7	U		9.7	U
ANTIMONY	UG/L	T		9.7	U		9.7	U		9.7	U		9.7	U		9.7	U		9.7	U
ARSENIC	UG/L	D		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U
ARSENIC	UG/L	T		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U		7.2	U
BARIUM	UG/L	D	10.7			10.7			10.6			11.2			11.4			11.1		
BARIUM	UG/L	T	11.3			11.5			11.5			11.8			11.7			11.7		
BERYLLIUM	UG/L	D		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U
BERYLLIUM	UG/L	T		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U		1.4	U
CADMIUM	UG/L	D		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U
CADMIUM	UG/L	T		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U		0.2	U
CHROMIUM	UG/L	D		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U
CHROMIUM	UG/L	T		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U		3.4	U
COPPER	UG/L	D	0.9		B	1.2		J	1		J	1.1		J	1.2		J	1.1		J
COPPER	UG/L	T	1.9		B	1.4		J	1.6		J	1.6		J	1.4		J	1.3		J
LEAD	UG/L	D		0.05	U	0.064		J	0.058		J	0.061		J	0.067		J	0.13		J
LEAD	UG/L	T	0.22		B	0.3		J	0.31		J	0.34		J	0.26		J	0.2		J
MERCURY	UG/L	D	0.00116		B	0.00351			0.00382		B	0.00263			0.00303			0.00382		
MERCURY	UG/L	T	0.00281		B	0.0395			0.0558			0.0278			0.0244			0.0149		
NICKEL	UG/L	D		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U
NICKEL	UG/L	T		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U		1.8	U
SELENIUM	UG/L	D		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U
SELENIUM	UG/L	T		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U		0.99	U
SILVER	UG/L	D		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U
SILVER	UG/L	T		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U		2.3	U
THALLIUM	UG/L	D		14	U		14	U		14	U		14	U		14	U		14	U
THALLIUM	UG/L	T		14	U		14	U		14	U		14	U		14	U		14	U
ZINC	UG/L	D		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U
ZINC	UG/L	T		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U		8.1	U
OTHER PARAMETERS																				
TOTAL HARDNESS AS CaCO3	MG/L	T	62.1			62.5			63.7			63.7			64.4			64.4		
TOTAL SUSPENDED SOLIDS	MG/L	T		3	U	4.4		J	4.4		J	3.6		J	3.6		J	3.6		J

**Notes:**  
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NA- Criterion for constituent based on the dissolved fraction.  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standards, Chronic FW2 Criteria  
1) The ecological screening value for cadmium, chromium, copper, nickel, and zinc were adjusted for hardness by using an average hardness of 63.8.

Table 8  
Summary of Phase I Surface-Water Analytical Results - Reach 3  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved(D)/Total (T)	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJSWQS <sup>1</sup>	WR-19			WR-20			WR-21			WR-22		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																			
ANTIMONY	UG/L	D	6	0	0	0	80		9.7	U		9.7	U		9.7	U		9.7	U
ANTIMONY	UG/L	T	6	0	0	0	80		9.7	U		9.7	U		9.7	U		9.7	U
ARSENIC	UG/L	D	6	0	0	0	150		7.2	U		7.2	U		7.2	U		7.2	U
ARSENIC	UG/L	T	6	0	0	0	NA		7.2	U		7.2	U		7.2	U		7.2	U
BARIUM	UG/L	D	6	6	10.4	10.9	220	10.5			10.5			10.9			10.4		
BARIUM	UG/L	T	6	6	10.9	11.4	NA	11			10.9			11.1			11.1		
BERYLLIUM	UG/L	D	6	0	0	0	3.6		1.4	U		1.4	U		1.4	U		1.4	U
BERYLLIUM	UG/L	T	6	0	0	0	3.6		1.4	U		1.4	U		1.4	U		1.4	U
CADMIUM	UG/L	D	6	0	0	0	0.118		0.2	U		0.2	U		0.2	U		0.2	U
CADMIUM	UG/L	T	6	0	0	0	0.181		0.2	U		0.2	U		0.2	U		0.2	U
CHROMIUM	UG/L	D	6	0	0	0	15.3		3.4	U		3.4	U		3.4	U		3.4	U
CHROMIUM	UG/L	T	6	0	0	0	55.2		3.4	U		3.4	U		3.4	U		3.4	U
COPPER	UG/L	D	6	6	1.1	1.7	5.3	1.1		J	1.6		J	1.5		J	1.7		J
COPPER	UG/L	T	6	6	1.5	2.2	5.9	1.5		J	2.2			2			2.1		
LEAD	UG/L	D	6	6	0.094	0.14	5.4	0.094		J	0.13		J	0.13		J	0.14		J
LEAD	UG/L	T	6	6	0.26	0.57	NA	0.26		J	0.42		J	0.38		J	0.56		J
MERCURY	UG/L	D	6	6	0.00245	0.00429	0.77	0.00429			0.00301			0.00287			0.0042		
MERCURY	UG/L	T	6	6	0.0225	0.0656	NA	0.0225			0.0656			0.0248			0.0338		
NICKEL	UG/L	D	6	0	0	0	27.9		1.8	U		1.8	U		1.8	U		1.8	U
NICKEL	UG/L	T	6	0	0	0	33		1.8	U		1.8	U		1.8	U		1.8	U
SELENIUM	UG/L	D	6	0	0	0	4.61		0.99	U		0.99	U		0.99	U		0.99	U
SELENIUM	UG/L	T	6	0	0	0	5		0.99	U		0.99	U		0.99	U		0.99	U
SILVER	UG/L	D	6	0	0	0	0.12		2.3	U		2.3	U		2.3	U		2.3	U
SILVER	UG/L	T	6	0	0	0	0.12		2.3	U		2.3	U		2.3	U		2.3	U
THALLIUM	UG/L	D	6	0	0	0	10		14	U		14	U		14	U		14	U
THALLIUM	UG/L	T	6	0	0	0	10		14	U		14	U		14	U		14	U
ZINC	UG/L	D	6	0	0	0	71.8		8.1	U		8.1	U		8.1	U		8.1	U
ZINC	UG/L	T	6	0	0	0	75.6		8.1	U		8.1	U		8.1	U		8.1	U
OTHER PARAMETERS																			
TOTAL HARDNESS AS CaCO3	MG/L	T	6	6	58.7	63.1	--	63.1			61.9			58.7			59.5		
TOTAL SUSPENDED SOLIDS	MG/L	T	6	6	3.2	5.6	--	3.2		J	4		J	3.2		J	4		J

**Notes:**  
ug/L - microgram per liter  
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J - Analyte present. Reported value may not be accurate or precise.  
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NA- Criterion for constituent based on the dissolved fraction.  
Mercury analysis using USEPA Method 1631  
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1) The ecological screening value for cadmium, chromium, copper, nickel, and zinc were adjusted for hardness by using an average hardness of 61.1.

Table 8  
Summary of Phase I Surface-Water Analytical Results - Reach 3  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved(D)/Total (T)	WR-23			WR-24		
			Result	MDL	Qualifier	Result	MDL	Qualifier
METALS								
ANTIMONY	UG/L	D		9.7	U		9.7	U
ANTIMONY	UG/L	T		9.7	U		9.7	U
ARSENIC	UG/L	D		7.2	U		7.2	U
ARSENIC	UG/L	T		7.2	U		7.2	U
BARIUM	UG/L	D	10.5			10.6		
BARIUM	UG/L	T	11.4			11.3		
BERYLLIUM	UG/L	D		1.4	U		1.4	U
BERYLLIUM	UG/L	T		1.4	U		1.4	U
CADMIUM	UG/L	D		0.2	U		0.2	U
CADMIUM	UG/L	T		0.2	U		0.2	U
CHROMIUM	UG/L	D		3.4	U		3.4	U
CHROMIUM	UG/L	T		3.4	U		3.4	U
COPPER	UG/L	D	1.6		J	1.5		J
COPPER	UG/L	T	1.9		J	1.8		J
LEAD	UG/L	D	0.13		J	0.14		J
LEAD	UG/L	T	0.57		J	0.39		J
MERCURY	UG/L	D	0.00245			0.00327		
MERCURY	UG/L	T	0.0376			0.0236		
NICKEL	UG/L	D		1.8	U		1.8	U
NICKEL	UG/L	T		1.8	U		1.8	U
SELENIUM	UG/L	D		0.99	U		0.99	U
SELENIUM	UG/L	T		0.99	U		0.99	U
SILVER	UG/L	D		2.3	U		2.3	U
SILVER	UG/L	T		2.3	U		2.3	U
THALLIUM	UG/L	D		14	U		14	U
THALLIUM	UG/L	T		14	U		14	U
ZINC	UG/L	D		8.1	U		8.1	U
ZINC	UG/L	T		8.1	U		8.1	U
OTHER PARAMETERS								
TOTAL HARDNESS AS CaCO3	MG/L	T	62.2			61.2		
TOTAL SUSPENDED SOLIDS	MG/L	T	5.6		J	3.6		J

**Notes:**  
ug/L - microgram per liter  
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**Table 9**  
**Summary of Surface-Water Quality Measurements**  
**Wanaque River Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Station	Temperature	Dissolved Oxygen		Conductivity	pH	ORP
	°C	mg/L	% Saturation	mS/cm		mV
<b>Phase I - December 2010</b>						
WR-01	8.88	10.93	94.3	0.166	7.39	128.8
WR-02	7.07	11.63	96.1	0.198	7.26	114.7
WR-03	6.92	11.46	94.3	0.197	7.26	110.9
WR-04	7.04	11.45	94.5	0.199	7.23	104.7
WR-05	7.06	11.5	94.9	0.200	7.16	117
WR-06	6.85	11.05	90.4	0.215	7.18	49.7
WR-07	6.8	11.68	95.8	0.214	7.23	122.7
WR-08	6.74	11.64	95.3	0.214	7.22	131.6
WR-09	6.61	11.67	95.4	0.213	7.18	119.1
WR-10	2.5	13.3	97.8	0.185	7.33	82.2
WR-11	2.28	13.7	100.1	0.182	7.25	112.4
WR-12	2.07	13.77	99.8	0.173	7.23	94.2
WR-13	2.03	13.76	99.5	0.171	7.11	102.8
WR-14	1.92	14.9	101.8	--	6.99	99.3
WR-15	5.77	11.17	89.3	0.201	7.21	73.3
WR-16	5.52	11.44	90.8	0.202	7.13	73.7
WR-17	5.35	11.01	87.1	0.202	7.19	96.2
WR-18	5.34	10.99	86.7	0.203	7.08	96.9
WR-19	6.45	12.23	99.5	0.205	7.31	118.3
WR-20	6.29	12.13	98.4	0.188	7.22	100.6
WR-21	6.22	12.12	98.1	0.19	7.17	111.8
WR-22	6.24	11.99	96.8	0.193	7.2	123.8
WR-23	6.08	12.25	98.7	0.192	7.2	117.3
WR-24	5.99	11.29	94.9	0.192	7.25	122.6
<b>Phase II - November 2010</b>						
PB-01	9.88	9.91	87.5	0.239	7.52	109.6
WR-01	12.47	8.58	80.5	0.278	6.99	189.9
WR-08	11.8	10.6	96.3	0.328	6.97	123.9
WR-10.5	11.12	8.48	77.3	0.315	7.4	182.8
WR-12	10.87	8.83	79.9	0.309	7.5	120.6
WR-13.5	10.87	9.15	82.8	0.299	7.6	169.5
WR-14	10.95	9.36	84.8	0.294	7.66	90.5
WR-14.5-L	9.9	9.35	82.7	0.295	7.5	136.3
WR-14.5-R	10.71	8.7	72.7	0.293	7.66	140.6
WR-15-L	8.49	8.12	69.5	0.301	7.37	109.5
WR-15-M	8.96	8.8	76.2	0.299	7.42	132.2
WR-15-R	9.48	8.74	76.4	0.298	7.48	138.4
WR-16	8.08	8.04	68.1	0.303	7.33	88.2
WR-17	7.88	7.45	63.5	0.305	7.49	156.8
WR-18	7.92	0.38	62	0.38	7.24	145.1
WR-19.5	9.81	8	70.8	0.343	7.21	89.3
WR-20	9.82	8.3	73.3	0.346	7.23	83.7
WR-20.5	10.01	9.4	83.5	0.297	7.36	111.7
WR-22.5	9.97	9.21	81.7	0.299	7.37	119
WR-23	9.9	9.32	82.5	0.296	7.36	112.3
WR-24.5	9.83	9.05	80	0.299	7.34	125.4

Notes:

--, Conductivity probe malfunction



Table 10  
Summary of Phase I Sediment Analytical Results - Reach 1  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJFWSC	Background Data <sup>1</sup>	WR-01			WR-02			WR-03			WR-04		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																			
ANTIMONY	MG/KG	9	0	0	0	NA	NC		1.93	U		3.37	U		4.54	U		2.91	U
ARSENIC	MG/KG	9	8	2.29	6.26	6	7.581		1.83	U	3.27		J	6.15		J	6.26		
BARIUM	MG/KG	9	9	61.9	128	NA	136.8	113			61.9			128			87.3		
BERYLLIUM	MG/KG	9	9	0.493	0.929	NA	0.976	0.504		J	0.493		J	0.631		J	0.666		J
CADMIUM	MG/KG	9	9	0.718	1.35	0.6	1.516	0.836		J	0.756		J	1.27		J	1.16		J
CHROMIUM	MG/KG	9	9	18.8	37.9	26	42.22	36.2			30.5			37.9			28.6		
COPPER	MG/KG	9	9	31.2	84.4	16	96.48	37.5			38.9			71.4			49.7		
LEAD	MG/KG	9	9	30.1	76.4	31	87.16	33.7			40.5			62.6			46.2		
MERCURY	MG/KG	9	9	0.0839	0.33	0.2	0.351	0.219		J	0.114		J	0.149		J	0.134		J
NICKEL	MG/KG	9	9	15.5	26.7	16	29.33	18.4			18.4			24.7			21.9		
SELENIUM	MG/KG	9	0	0	0	NA	NC		1.89	U		3.31	U		4.45	U		2.85	U
SILVER	MG/KG	9	0	0	0	1	NC		0.347	U		0.607	U		0.817	U		0.523	U
THALLIUM	MG/KG	9	0	0	0	NA	NC		2.8	U		4.89	U		6.58	U		4.22	U
ZINC	MG/KG	9	9	112	203	120	219.7	170			118			203			146		
SEM/AVS																			
MERCURY	UMOL/G	9	1	0.000086	0.000086	--	--		0.000009	U,R		0.000008	U,R		0.000009	U, R		0.000008	U,R
SILVER	UMOL/G	9	2	0.000452	0.00101	--	--	0.00101		J		0.000403	U,J		0.000414	U,J		0.000405	U,J
CADMIUM	UMOL/G	9	6	0.00031	0.00105	--	--		0.000311	U,J		0.000301	U,J	0.000362		J		0.000302	U,J
COPPER	UMOL/G	9	9	0.0633	0.14	--	--	0.0763		J	0.064		J	0.0651		J	0.0633		J
LEAD	UMOL/G	9	9	0.0229	0.0866	--	--	0.0267			0.0229			0.0269			0.0246		
NICKEL	UMOL/G	9	9	0.0102	0.0289	--	--	0.0194		J	0.0102		J	0.013		J	0.0106		J
ZINC	UMOL/G	9	9	0.173	0.455	--	--	0.455			0.173			0.226			0.182		
SEM (total)	UMOL/G	9	9	0.270804	0.647751	--	--	0.579			0.271			0.332			0.281		
ACID VOLATILE SULFIDE	UMOL/G	9	8	1.2	26.3	--	--	2.8				0.63	U	4.6			1.2		J
OTHER PARAMETERS																			
TOTAL ORGANIC CARBON	MG/KG	9	9	16300	76300	--	--	19400			75300			76300			56300		
GRAIN SIZE	% passing 0.64 mm	9	9	6	74	--	--	6			35			54			34		

**Notes:**  
-- Not applicable  
mg/kg - milligram per kilogram  
umol/g - micromole per gram  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in lab or field blanks.  
UJ - Not detected. Reporting limit may not be accurate or precise.  
R - Unusable result. Analyte may or may not be present in the sample.  
NJFWSC - New Jersey Freshwater Sediment Criteria -  
Lowest Effects Level (LEL)  
NA - Value not available  
NC- Value not calculated  
1) Background concentrations for each metal were represented as the UTL95 concentration calculated from the December 2009 sediment dataset for Reach 1.

Table 10  
Summary of Phase I Sediment Analytical Results - Reach 1  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	WR-05			WR-06			WR-06-DUP			WR-07			WR-08		
		Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																
ANTIMONY	MG/KG		2.35	U		2.26	U		2.23	U		2.3	U		2.48	U
ARSENIC	MG/KG	2.54		J	4.93			5.24			2.29		J	4.81		J
BARIUM	MG/KG	77.2			91.6			92.9			92.8			107		
BERYLLIUM	MG/KG	0.518		J	0.852		J	0.873		J	0.6		J	0.929		J
CADMIUM	MG/KG	0.98		J	1.17			1.17			0.718		J	1.35		
CHROMIUM	MG/KG	26.6			31.4			31.9			18.8			32.3		
COPPER	MG/KG	31.2			78.1			74.8			33.3			84.4		
LEAD	MG/KG	34.4			73.8			70.8			30.1			76.4		
MERCURY	MG/KG	0.0994		J	0.265		J	0.234		J	0.0839		J	0.33		J
NICKEL	MG/KG	20.6			25.3			24.8			15.5			26.7		
SELENIUM	MG/KG		2.3	U		2.21	U		2.19	U		2.25	U		2.43	U
SILVER	MG/KG		0.422	U		0.407	U		0.402	U		0.414	U		0.447	U
THALLIUM	MG/KG		3.4	U		3.28	U		3.24	U		3.34	U		3.6	U
ZINC	MG/KG	123			160			163			112			187		
SEM/AVS																
MERCURY	UMOL/G		0.000009	U,R		0.000009	U,R		0.000009	U,R	0.000009	0.000009	U,R		0.000008	U,R
SILVER	UMOL/G		0.000417	U,J		0.000416	U,J		0.000417	R,J	0.000452		J		0.000401	U,J
CADMIUM	UMOL/G	0.000385		J	0.000952		J	0.000926		J	0.00031	0.00031	U,J	0.00105		J
COPPER	UMOL/G	0.0673		J	0.0859		J	0.0747		J	0.0718		J	0.14		J
LEAD	UMOL/G	0.0328			0.074			0.0866			0.0279			0.0656		
NICKEL	UMOL/G	0.0136		J	0.0268		J	0.0289		J	0.0158		J	0.0217		J
ZINC	UMOL/G	0.292			0.368			0.397			0.261			0.419		
SEM (total)	UMOL/G	0.407			0.556			0.590543			0.377			0.648		
ACID VOLATILE SULFIDE	UMOL/G	1.3		J	15			26.3			2.1			3.2		
OTHER PARAMETERS																
TOTAL ORGANIC CARBON	MG/KG	47500			27100			26400			22400			16300		
GRAIN SIZE	% passing 0.64 mm	17.5			66.5			65			16			74		

**Notes:**  
-- Not applicable  
mg/kg - milligram per kilogram  
umol/g - micromole per gram  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in lab or field blanks.  
UJ - Not detected. Reporting limit may not be accurate or precise.  
R - Unusable result. Analyte may or may not be present in the sample.  
NJFWSC - New Jersey Freshwater Sediment Criteria -  
Lowest Effects Level (LEL)  
NA - Value not available  
NC- Value not calculated  
1) Background concentrations for each metal were represented as the  
UTL95 concentration calculated from the December 2009 sediment  
dataset for Reach 1.

Table 11  
Summary of Phase I Sediment Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJFWSC	Background Data <sup>1</sup>	WR-09			WR-10			WR-11			WR-12			WR-13		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																						
ANTIMONY	MG/KG	11	0	0	0	NA	NC		4.28	U		3	U		1.94	U		2.09	U		3.14	U
ARSENIC	MG/KG	11	9	1.96	16.2	6	7.581	4.97		J	4.65		J	1.96		J	2.23		J	6.57		
BARIUM	MG/KG	11	11	33.6	127	NA	136.8	114			73.5			56.8			58.5			112		
BERYLLIUM	MG/KG	11	11	0.302	1.55	NA	0.976	1.22		J	0.641		J	0.472		J	0.545		J	1.12		J
CADMIUM	MG/KG	11	8	0.423	1.34	0.6	1.516	1.34		J	1		J	0.556		J	0.702		J	0.786		J
CHROMIUM	MG/KG	11	11	12.5	48.2	26	42.22	34.3			22.6			17.9			20.1			36.6		
COPPER	MG/KG	11	11	23.6	297	16	96.48	64.9			45.3			23.6			33.6			139		J
LEAD	MG/KG	11	11	22	305	31	87.16	76.3			64.2			25.9			39			127		J
MERCURY	MG/KG	11	11	0.115	57.4	0.2	0.351	0.2		J	0.504		J	0.115		J	0.415		J	20.1		
NICKEL	MG/KG	11	11	7.92	28.5	16	29.33	28.5			16.8			12.9			14.8			23.7		
SELENIUM	MG/KG	11	0	0	0	NA	NC		4.2	U		2.65	U		1.9	U		2.05	U		3.08	U
SILVER	MG/KG	11	0	0	0	1	NC		0.771	U		0.487	U		0.35	U		0.377	U		0.566	U
THALLIUM	MG/KG	11	0	0	0	NA	NC		6.21	U		3.92	U		2.82	U		3.04	U		4.56	U
ZINC	MG/KG	11	11	70.2	328	120	219.7	244			171			88.2			123			221		J
SEM/AVS																						
MERCURY	UMOL/G	11	2	0.000111	0.000304	--	--		0.000009	U,R		0.000009	U,R		0.000009	U,R		0.000009	U,R		0.000009	U,R
SILVER	UMOL/G	11	1	0.000424	0.000424	--	--		0.000417	U,J		0.000414	U,J		0.000414	U,J		0.000417	U,J	0.000424		J
CADMIUM	UMOL/G	11	10	0.00032	0.0013	--	--	0.000541		J	0.000723		J	0.00032		J	0.000531		J	0.0013		J
COPPER	UMOL/G	11	11	0.0651	0.216	--	--	0.0776		J	0.0747		J	0.0651		J	0.0672		J	0.0977		J
LEAD	UMOL/G	11	11	0.029	0.135	--	--	0.038			0.0416			0.029			0.0435			0.0733		J
NICKEL	UMOL/G	11	11	0.00852	0.0183	--	--	0.0183		J	0.0109		J	0.0134		J	0.0162		J	0.0142		J
ZINC	UMOL/G	11	11	0.235	0.41	--	--	0.332			0.347			0.235			0.342			0.324		J
SEM (total)	UMOL/G	11	11	0.343234	4.5	--	--	0.467			0.475			0.343			0.470			0.511		
ACID VOLATILE SULFIDE	UMOL/G	11	11	0.78	8.7	--	--	6.2			3.5			1.3		J	8.7			2.4		
OTHER PARAMETERS																						
TOTAL ORGANIC CARBON	MG/KG	11	11	9350	60200	--	--	55100			59700			12600			16500			60200		
GRAIN SIZE	% passing 0.64 mm	11	10	11	64	--	--	51			32			21						64		

**Notes:**  
-- Not applicable  
mg/kg - milligram per kilogram  
umol/g - micromole per gram  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in the laboratory or field blanks.  
UJ - Not detected. Reporting limit may not be accurate or precise.  
R - Unusable result. Analyte may or may not be present in the sample.  
NJFWSC - New Jersey Freshwater Sediment Criteria - Lowest Effects Level (LEL)  
NA - Value not available  
NC - Value not calculated  
1) Background concentrations for each metal were represented as the UTL95 concentration calculated from the December 2009 sediment dataset for Reach 1.

Table 11  
Summary of Phase I Sediment Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	WR-14			WR-15			WR-16			WR-17			WR-18			WR-18-DUP		
		Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																			
ANTIMONY	MG/KG		2.68	U		1.85	U		2.08	U		1.9	U		2.88	U		3.15	U
ARSENIC	MG/KG		2.54	U		1.75	U	2.77		J	1.97		J	12.9			16.2		
BARIUM	MG/KG	60.9			39.5			43.7			33.6			114			127		
BERYLLIUM	MG/KG	0.619		J	0.341		J	0.399		J	0.302		J	1.28		J	1.55		J
CADMIUM	MG/KG	0.423		J		0.258	U		0.291	U		0.266	U	1.01		J	1.22		J
CHROMIUM	MG/KG	21.4			12.7			14.9			12.5			40.3			48.2		
COPPER	MG/KG	89.7		J	37.1		J	45.1		J	127		J	253		J	297		J
LEAD	MG/KG	40.8		J	22		J	37.5		J	29		J	226		J	305		J
MERCURY	MG/KG	5.88			9.53			9.14			52.6			57.4			24.8		
NICKEL	MG/KG	15.5			8.73			10.6			7.92			23.4			25.7		
SELENIUM	MG/KG		2.62	U		1.81	U		2.04	U		1.86	U		2.82	U		3.09	U
SILVER	MG/KG		0.482	U		0.332	U		0.374	U		0.341	U		0.519	U		0.568	U
THALLIUM	MG/KG		3.88	U		2.68	U		3.01	U		2.75	U		4.18	U		4.57	U
ZINC	MG/KG	142		J	72		J	99.1		J	70.2		J	289		J	328		J
SEM/AVS																			
MERCURY	UMOL/G		0.000008	U,R		0.000009	U,R		0.000009	U,R	0.000304		J	0.000111		J		0.000008	U,R
SILVER	UMOL/G		0.000405	U,J		0.000413	U,J		0.000415	U,J		0.000405	U,J		0.000402	U,J		0.000401	U,J
CADMIUM	UMOL/G	0.000587		J	0.000328		J	0.000445		J		0.000302	U,J	0.000901		J	0.000847		J
COPPER	UMOL/G	0.0942		J	0.0937		J	0.0959		J	0.207		J	0.216		J	0.189		J
LEAD	UMOL/G	0.0426			0.0329			0.0332			0.0449			0.128			0.135		
NICKEL	UMOL/G	0.0142		J	0.0115		J	0.0107		J	0.00852		J	0.0128		J	0.0121		J
ZINC	UMOL/G	0.333			0.281			0.299			0.248			0.395			0.410		
SEM (total)	UMOL/G	0.485			4.5			0.440			0.509			0.753			0.747		
ACID VOLATILE SULFIDE	UMOL/G	5.6			4.5			2.8			1.1		J	0.78		J	0.94		J
OTHER PARAMETERS																			
TOTAL ORGANIC CARBON	MG/KG	33700			23200			33500			9350			48400			50500		
GRAIN SIZE	% passing 0.64 mm	43			15.5			31			11			41			44		

**Notes:**  
-- Not applicable  
mg/kg - milligram per kilogram  
umol/g - micromole per gram  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in the laboratory or field blanks.  
UJ - Not detected. Reporting limit may not be accurate or precise.  
R - Unusable result. Analyte may or may not be present in the sample.  
NJFWSC - New Jersey Freshwater Sediment Criteria - Lowest Effects Level (LEL)  
NA - Value not available  
NC - Value not calculated  
1) Background concentrations for each metal were represented as the UTL95 concentration calculated from the December 2009 sediment dataset for Reach 1.

Table 12  
Summary of Phase I Sediment Analytical Results - Reach 3  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJFWSC	Background Data <sup>1</sup>	WR-19			WR-20			WR-21			WR-22			WR-23			WR-24		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																									
ANTIMONY	MG/KG	6	0	0	0	NA	NC		3.3	U		1	U		2.55	U		5.62	U		1.48	U		5.56	U
ARSENIC	MG/KG	6	0	0	0	6	7.581		3.14	U		1.39	U		2.43	U		5.34	U		1.41	U		5.28	U
BARIUM	MG/KG	6	6	18.9	69.7	NA	136.8	69.7			24.8			52.4			45.6			18.9			36.7		
BERYLLIUM	MG/KG	6	5	0.201	0.697	NA	0.976	0.538		J	0.404		J	0.697		J	0.523		J	0.201		J		0.378	U
CADMIUM	MG/KG	6	1	0.531	0.531	0.6	1.516		0.462	U		0.205	U	0.531		J		0.787	U		0.207	U		0.778	U
CHROMIUM	MG/KG	6	6	7.87	20.5	26	42.22	17.4			20.5			19			16.1			11.5			7.87		J
COPPER	MG/KG	6	6	13.1	79.5	16	96.48	76.6		J	24.2		J	79.5		J	61.5		J	13.1		J	28.8		J
LEAD	MG/KG	6	6	10.1	51.9	31	87.16	27.5		J	24.9		J	51.9		J	37.9		J	10.1		J	18.6		J
MERCURY	MG/KG	6	6	0.943	10.3	0.2	0.351	4.34			3.1			10.3			4.06			0.943			2.88		
NICKEL	MG/KG	6	6	5.65	17.8	16	29.33	17.8			11.8			14			10.4			7.16			5.65		
SELENIUM	MG/KG	6	0	0	0	NA	NC		3.23	U		1.43	U		2.5	U		5.51	U		1.45	U		5.45	U
SILVER	MG/KG	6	0	0	0	1	NC		0.594	U		0.264	U		0.46	U		1.01	U		0.266	U		1	U
THALLIUM	MG/KG	6	0	0	0	NA	NC		4.79	U		2.12	U		3.7	U		8.15	U		2.14	U		8.06	U
ZINC	MG/KG	6	6	43.4	192	120	219.7	117		J	106		J	192		J	128		J	43.4		J	80		J
SEM/AVS																									
MERCURY	UMOL/G	6	1	0.0000721	0.0000721	--	--		0.000008	U,R	0.0000721		J		0.000009	U,R		0.000009	U,R		0.000009	U,R		0.000009	U,R
SILVER	UMOL/G	6	3	0.000429	0.000545	--	--		0.000401	U,R	0.000429		J	0.00043		J	0.000416	U,R		0.000415	U,R	0.000545		J	
CADMIUM	UMOL/G	6	6	0.000393	0.00165	--	--	0.000734		J	0.000604		J	0.00165		J	0.000393		J	0.000434		J	0.000716		J
COPPER	UMOL/G	6	6	0.0612	0.137	--	--	0.0863		J	0.0686		J	0.137		J	0.0612		J	0.0804		J	0.0862		J
LEAD	UMOL/G	6	6	0.0179	0.067	--	--	0.0286		J	0.0371		J	0.067		J	0.0179		J	0.0217		J	0.0293		J
NICKEL	UMOL/G	6	6	0.00595	0.0178	--	--	0.011		J	0.012		J	0.0178		J	0.00761		J	0.00595		J	0.0102		J
ZINC	UMOL/G	6	6	0.184	0.67	--	--	0.255		J	0.305		J	0.670		J	0.194		J	0.184		J	0.322		J
SEM (total)	UMOL/G	6	6	0.281103	0.89388	--	--	0.382			0.424			0.894			0.281			0.292			0.449		
ACID VOLATILE SULFIDE	UMOL/G	6	4	1.3	3.6	--	--	3.6				0.63	U	1.8		J	2.2				0.63	U	1.3		J
OTHER PARAMETERS																									
TOTAL ORGANIC CARBON	MG/KG	6	6	2680	55100	--	--	42600			7180			35700			55100			2680			50600		
GRAIN SIZE	% passing 0.64 mm	6	6	2	60	--	--	36			7			47.5			28.5			2			60		

**Notes:**  
-- Not applicable  
mg/kg - milligram per kilogram  
umol/g - micromole per gram  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in the laboratory or field blanks.  
UJ - Not detected. Reporting limit may not be accurate or precise.  
R - Unusable result. Analyte may or may not be present in the sample.  
NJFWSC - New Jersey Freshwater Sediment Criteria - Lowest Effects Level (LEL)  
NA - Value not available  
NC - Value not calculated  
1) Background concentrations for each metal were represented as the UTL95 concentration calculated from the December 2009 sediment dataset for Reach 1.

Table 13  
Summary of Phase II Surface Water Analytical Results - Reach 1  
Wanaque River Phase II Investigation  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved(D) / Total (T)	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJSWQS	WR-01			WR-08A			WR-08B			WR-08C		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																			
MERCURY	µg/L	D	4	4	0.00057	0.00163	0.77	0.00163			0.00075			0.00071			0.00057		
MERCURY	µg/L	T	4	4	0.00216	0.00612	NA	0.00612			0.00216			0.00241			0.0022		
METHYL MERCURY	µg/L	D	4	4	0.000023	0.000038	--	0.000028		J	0.000034		J	0.000038		J	0.000023	J	
METHYL MERCURY	µg/L	T	4	4	0.00004	0.000053	--	0.000045		J	0.000053			0.00004		J	0.000044	J	
OTHER PARAMETERS																			
TOTAL SUSPENDED SOLIDS	µg/L	T	4	4	2100	5100	--	5100			2200			2100			2300		

Notes:  
µg/L - microgram per liter  
J - Analyte present. Reported value may not be accurate or precise.  
NA- Criterion for constituent based on the dissolved fraction.  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standards,  
Chronic FW2 Criteria

Table 14  
Summary of Phase II Surface-Water Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved (D)/ Total (T)	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJSWQS	WR-10.5			WR-12			WR-12-DUP			WR-13.5			WR-14-A			WR-14-B			WR-14-C		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																												
MERCURY	µg/L	D	29	29	0.00075	0.00641	0.77	0.00075			0.001		J	0.00073			0.00089		J	0.00114		J	0.00126		J	0.00129		J
MERCURY	µg/L	T	29	29	0.00208	0.0646	NA	0.00208			0.00235			0.00222			0.00252		J	0.00248		J	0.00314		J	0.00277		J
METHYL MERCURY	µg/L	D	11	9	0.00002	0.000061	--		0.00002	U	0.000024		J	0.000021		J	0.000024		J	0.000021		J	0.000027		J		0.00002	U
METHYL MERCURY	µg/L	T	11	10	0.00003	0.000113	--	0.000036		J	0.000038		J	0.000036		J	0.000039		J	0.000043		J	0.000035		J	3.4E-05		J
OTHER PARAMETERS																												
TOTAL SUSPENDED SOLIDS	µg/L	T	29	29	1200	3700	--	2000		B	1700		B	2100		B	1900		B	1600		B	1900		B	1700		B

Notes:  
µg/L - microgram per liter  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
B - Not detected substantially above the level reported in the laboratory  
or field blanks.  
NA- Criterion for constituent based on the dissolved fraction.  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standards,  
Chronic FW2 Criteria

Table 14  
Summary of Phase II Surface-Water Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved (D)/ Total (T)	WR-14.5L-A			WR-14.5L-B			WR-14.5L-C			WR-14.5M-A			WR-14.5M-B			WR-14.5M-C			WR-14.5R-A			WR-14.5R-B			WR-14.5R-C			WR-15L-A					
			Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier			
METALS																																			
MERCURY	µg/L	D	0.00501		J	0.00641		J	0.00568		J	0.00444		J	0.0041		J	0.0046		J	0.00452		J	0.00469		J	0.00478		J	0.005		J			
MERCURY	µg/L	T	0.0135		J	0.0187		J	0.0646		J	0.0118		J	0.0117		J	0.0121		J	0.0109		J	0.0112		J	0.0113		J	0.012		J			
METHYL MERCURY	µg/L	D																																	
METHYL MERCURY	µg/L	T																																	
OTHER PARAMETERS																																			
TOTAL SUSPENDED SOLIDS	µg/L	T	1800		B	3700			1800		B	1600		B	1700		B	1600		B	1200		B	1700		B	2000		B	2000		B			

Notes:  
µg/L - microgram per liter  
U - not detected  
J - Analyte present. Reported value may not be accurate  
B - Not detected substantially above the level reported in  
or field blanks.  
NA- Criterion for constituent based on the dissolved fract  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standard:  
Chronic FW2 Criteria



Table 14  
Summary of Phase II Surface-Water Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved (D)/ Total (T)	WR-15L-B			WR-15L-C			WR-15M-A			WR-15M-B			WR-15M-C			WR-15R-A			WR-15R-B			WR-15R-C			WR-16			WR-16-DUP		
			Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																																
MERCURY	µg/L	D	0.0045		J	0.00453			0.00417			0.00425			0.00418			0.00328			0.00373			0.0033			0.00422			0.00443		
MERCURY	µg/L	T	0.011		J	0.0122			0.0123			0.00977			0.00999			0.00794			0.00864			0.00827			0.0143			0.0149		
METHYL MERCURY	µg/L	D																								0.000046		J	0.000038		J	
METHYL MERCURY	µg/L	T																								0.000066			0.000072			
OTHER PARAMETERS																																
TOTAL SUSPENDED SOLIDS	µg/L	T	1600		B	2200		B	1400		B	2300		B	1700		B	1600		B	1600		B	1500		B	2200		B	2300		B

Notes:  
µg/L - microgram per liter  
U - not detected  
J - Analyte present. Reported value may not be accurate  
B - Not detected substantially above the level reported in  
or field blanks.  
NA- Criterion for constituent based on the dissolved fract  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standards  
Chronic FW2 Criteria

Table 15  
Summary of Phase II Surface-Water Analytical Results - Reach 3  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved(D) / Total (T)	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJSWQS	PB-01-B			PB-01-C			WR-19.5-A			WR-19.5-B			WR-19.5-C			WR-19.5-D			WR-20.5			WR-20.5-DUP		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																															
MERCURY	µg/L	D	18	18	0.00394	0.0172	0.77	0.00053			0.0005			0.00584			0.0111			0.0172			0.0126			0.00403			0.00401		
MERCURY	µg/L	T	18	18	0.0634	0.203	NA	0.00499			0.00221			0.0855			0.0878			0.195			0.203			0.0634			0.092		
METHYL MERCURY	µg/L	D	17	16	0.000116	0.000175	--	0.000031		J		0.00002	U	0.000131			0.000168			0.000175						0.000125			0.000121		
METHYL MERCURY	µg/L	T	17	17	0.000329	0.000477	--	0.000042		J	0.000038		J	0.000329			0.000409			0.000438						0.000341			0.000317		
OTHER PARAMETERS																															
TOTAL SUSPENDED SOLIDS	µg/L	T	18	18	3300	5600	--	7100		J	11600		J	4000		J	3900		J	4600		J	5600		J	4700		J	4300		J

Notes:  
µg/L - microgram per liter  
U - not detected  
J - Analyte present. Reported value may not be accurate or precise.  
NA- Criterion for constituent based on the dissolved fraction.  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standards,  
Chronic FW2 Criteria

Table 15  
Summary of Phase II Surface-Water Analytical Results - Reach 3  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Dissolved(D) / Total (T)	WR-20-A			WR-20-B			WR-20-C			WR-22.5-A			WR-22.5-B			WR-22.5-C			WR-23			WR-23-DUP			WR-24.5			WR-24.5-DUP		
			Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																																
MERCURY	µg/L	D	0.0069			0.00677			0.00783			0.00394			0.00732			0.0041			0.00775			0.412			0.00462			0.00503		
MERCURY	µg/L	T	0.0852			0.0812			0.0833			0.0929			0.0887			0.0752			0.0678			0.0044			0.0716			0.0549		
METHYL MERCURY	µg/L	D	0.000168			0.000151			0.000158			0.000116			0.000131			0.000173			0.00017			0.000147			0.000164			0.000188		
METHYL MERCURY	µg/L	T	0.00036			0.000384			0.000367			0.000443			0.000417			0.000382			0.000422			0.000462			0.000477			0.00044		
OTHER PARAMETERS																																
TOTAL SUSPENDED SOLIDS	µg/L	T	3300		J	3700		J	3900		J	4600		J	4400		J	3800		J	4100		J	6300		J	3900		J	4000		J

Notes:  
µg/L - microgram per liter  
U - not detected  
J - Analyte present. Reported value may not be accurate  
NA- Criterion for constituent based on the dissolved fract  
Mercury analysis using USEPA Method 1631  
NJSWQS - New Jersey Surface Water Quality Standard:  
Chronic FW2 Criteria

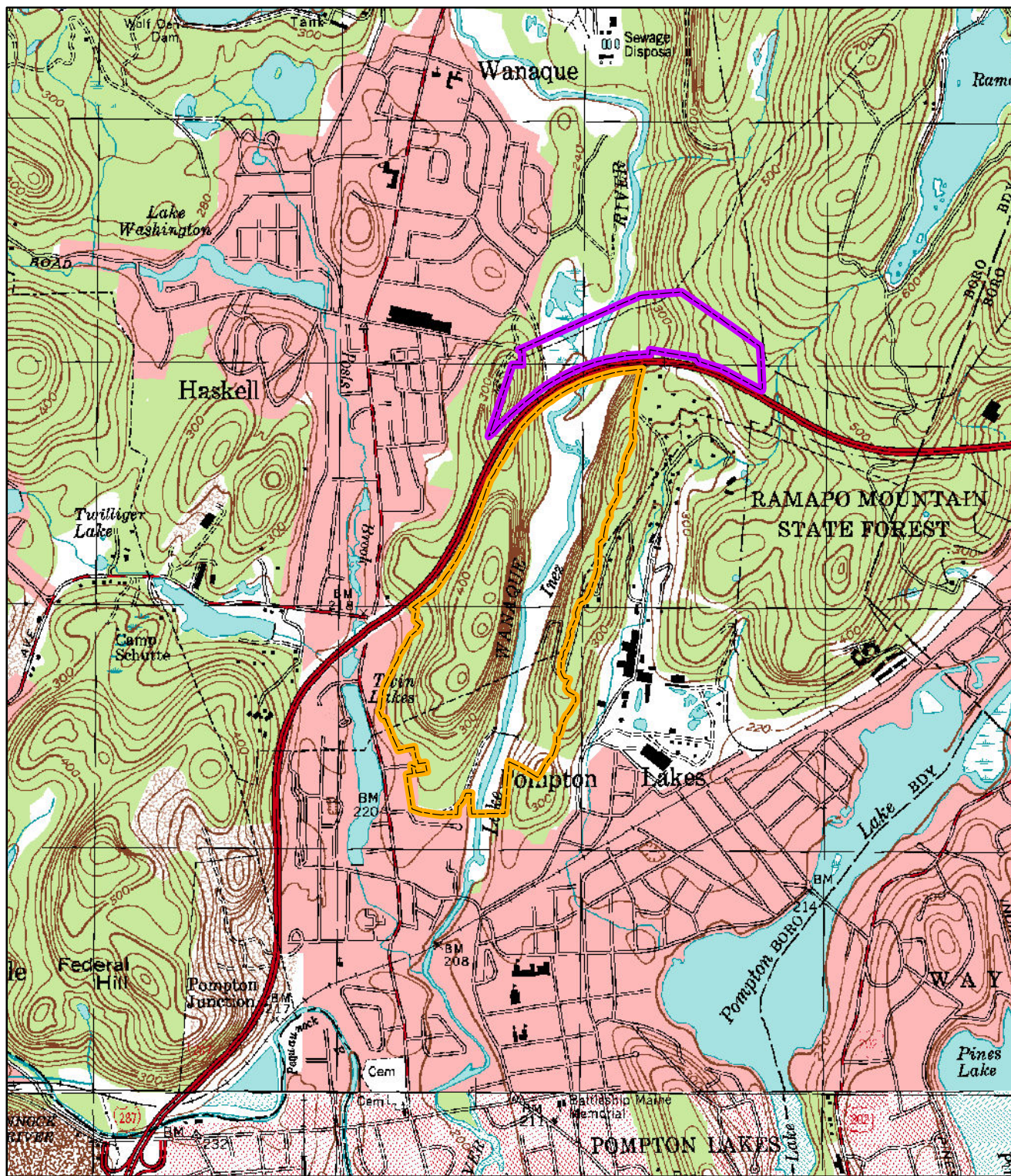
Table 16  
Summary of Phase II Sediment Analytical Results - Reach 2  
Wanaque River Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey

Analyte	Units	Number of Samples	Number of Detections	Minimum Detection	Maximum Detection	NJFWSC LEL	Background Data <sup>1</sup>	WR-17A			WR-17A-DUP			WR-17B			WR-17C			WR-18A			WR-18B		
								Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier	Result	MDL	Qualifier
METALS																									
MERCURY	MG/KG	6	6	23.2	102	0.2	0.315	86.6			80.8			72.1			102			30.5			23.2		
OTHER PARAMETERS																									
TOTAL ORGANIC CARBON	MG/KG	6	6	16200	41100	--	--	19100		B	22300		B	41100		B	26700		B	16200		B	36200		B
GRAIN SIZE	% passing 0.64 mm	6	6	16	73.5	--	--	16			15			43			31			73.5			68		



Notes:  
-- Not applicable  
mg/kg - milligram per kilogram  
or precise.  
B - Not detected substantially above the level reported  
in the laboratory or field blanks.  
NJFWSC - New Jersey Freshwater Sediment  
Criteria - Lowest Effects Level (LEL)  
1) Background concentration for mercury was  
represented as the UTL95 concentration calculated  
from the December 2009 sediment dataset for Reach 1.

## Figures





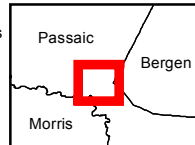
#### Legend

-  Northern Manufacturing Area
-  Western Manufacturing Area

0 1,000 2,000 4,000  
Feet

1 inch = 2,000 feet

Reference:  
USGS Topographic Quadrangles  
Wanaque, NJ 2000  
Pompton Plains, NJ 1998



335 Commerce Drive, Suite 300  
Fort Washington, PA 19034  
Phone: (215) 367-2500 Fax: (215) 367-1000

Job: 18985452.00004

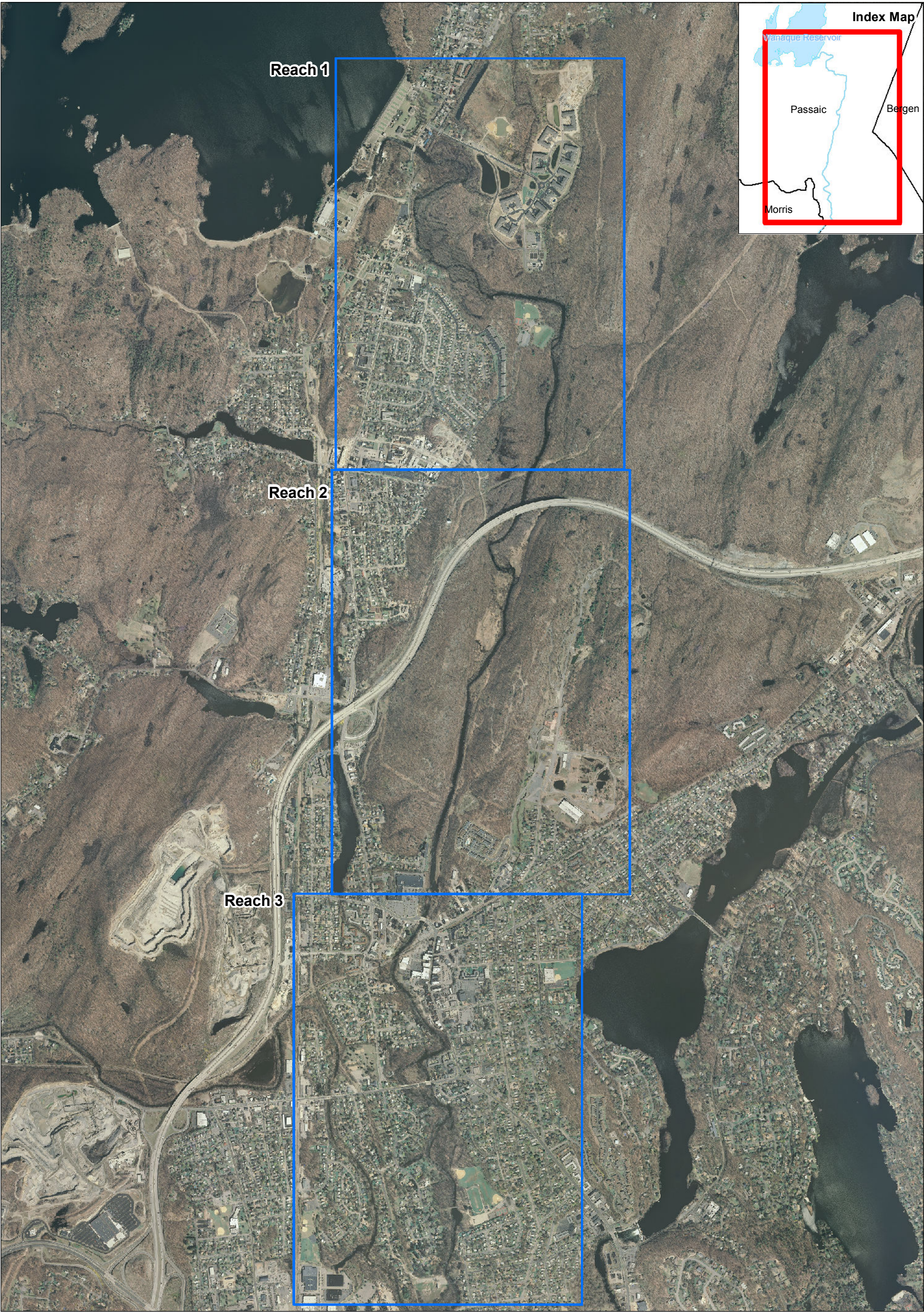
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Checked by: DR

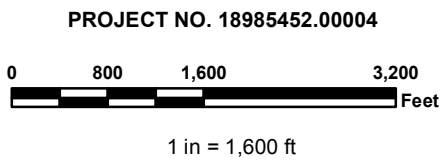
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Figure 1  
Site Location Map  
Wanaque River  
Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey



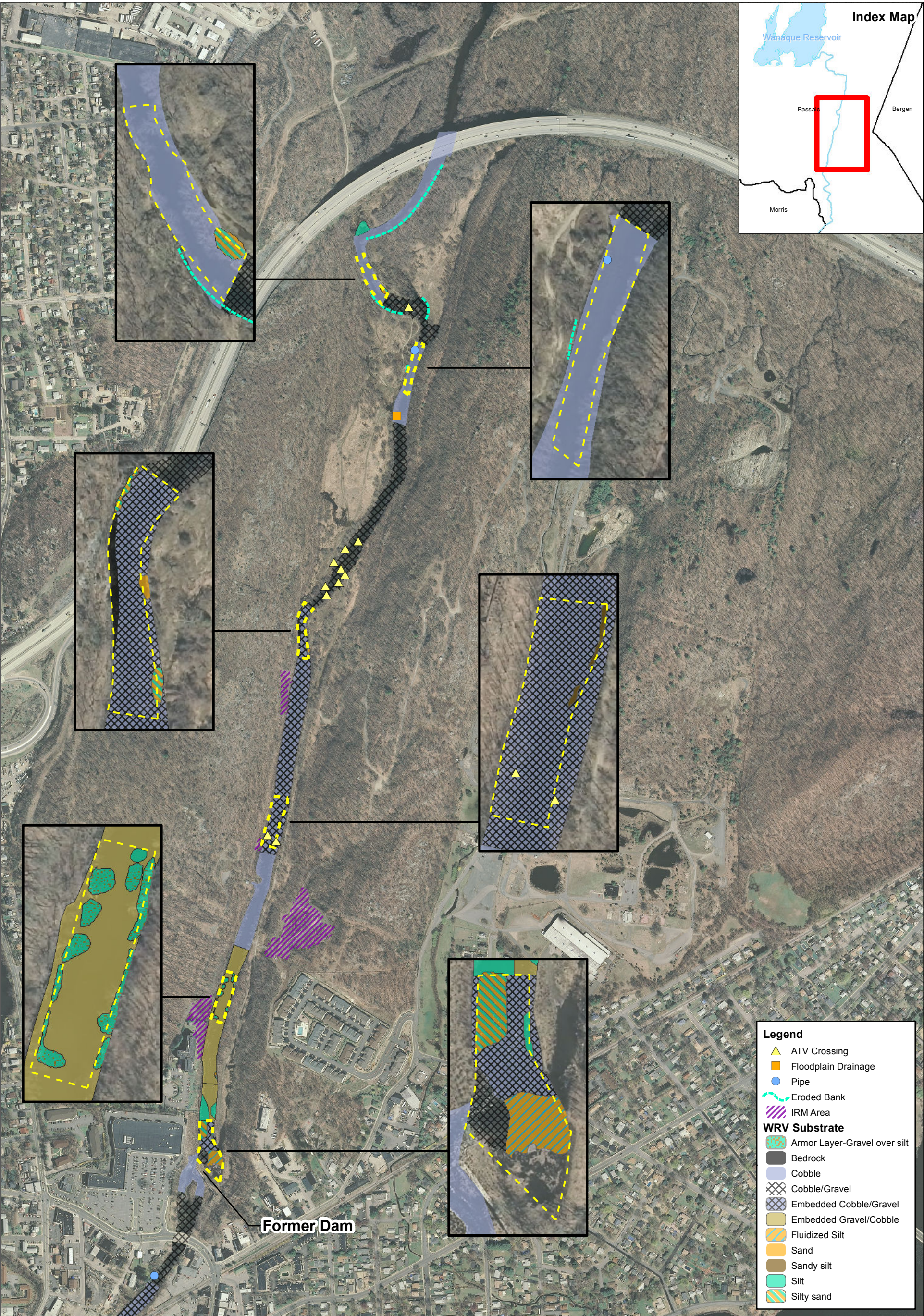


Source: Aerial Photography - NJDEP 2007

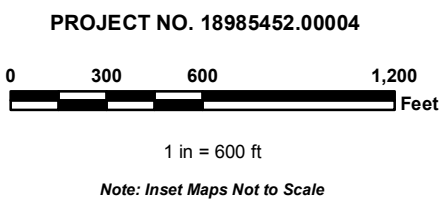


**Figure 2**  
**Overview of Study Area**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



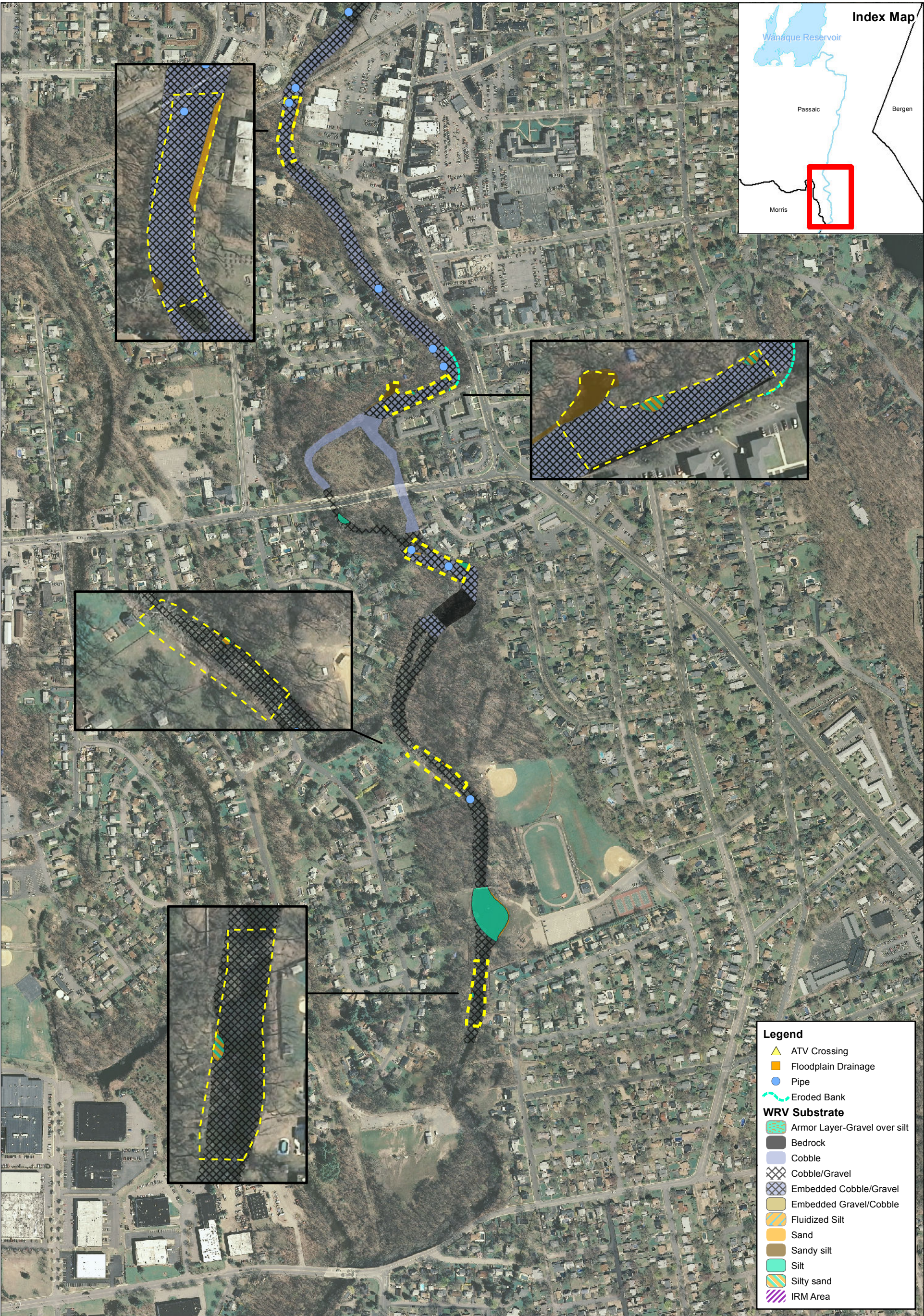


Source: Aerial Photography - NJDEP 2007



**Figure 3**  
**Reach 2 - Bank Disturbance and Substrate Mapping**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

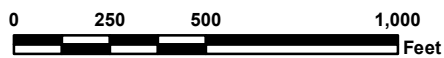




Source: Aerial Photography - NJDEP 2007



PROJECT NO. 18985452.00004

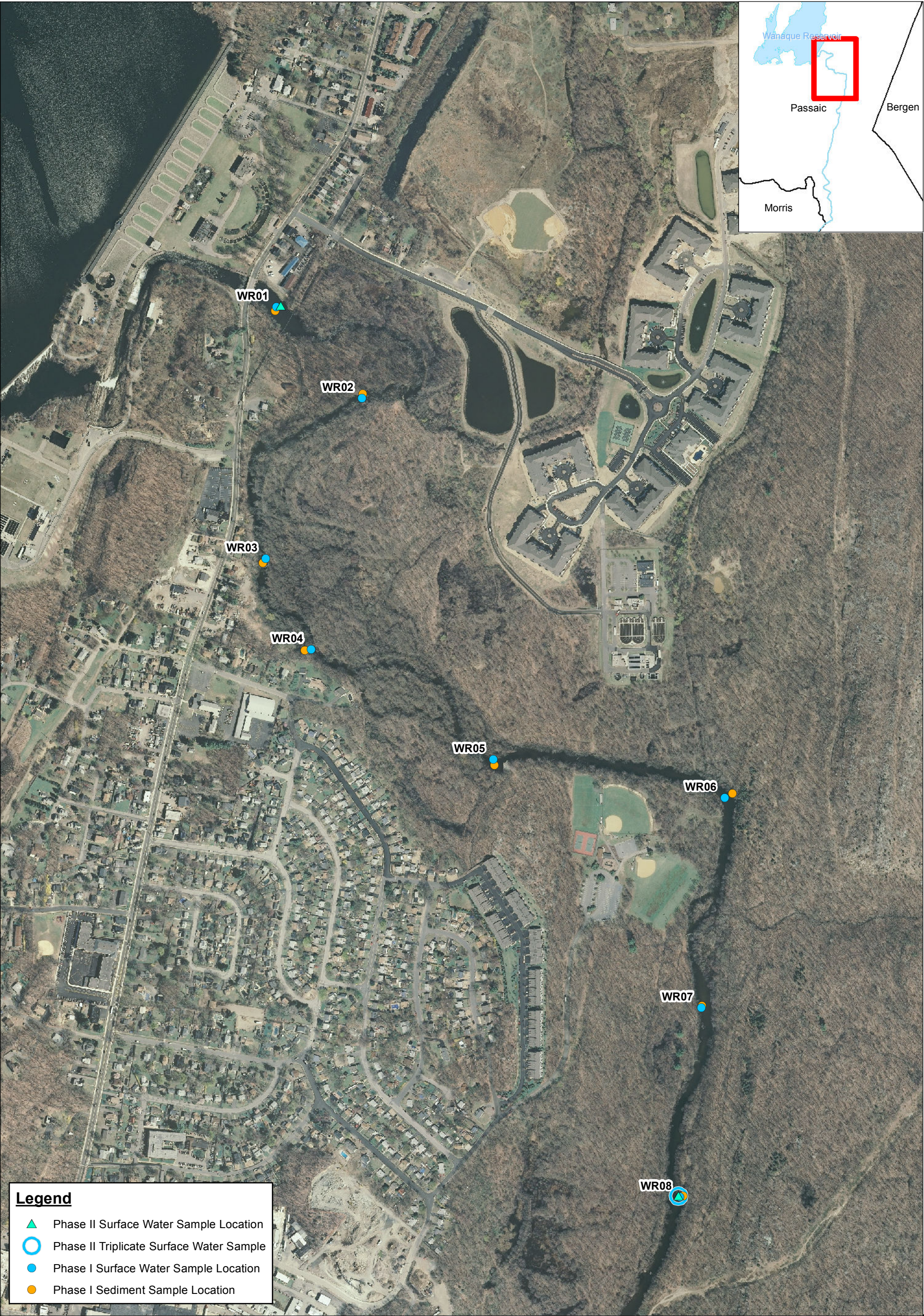


1 in = 500 ft

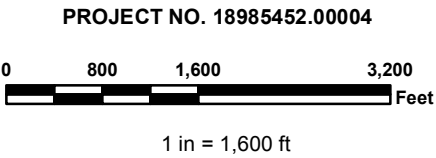
Note: Inset Maps Not to Scale

**Figure 4**  
**Reach 3 - Bank Disturbance and Substrate Mapping**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



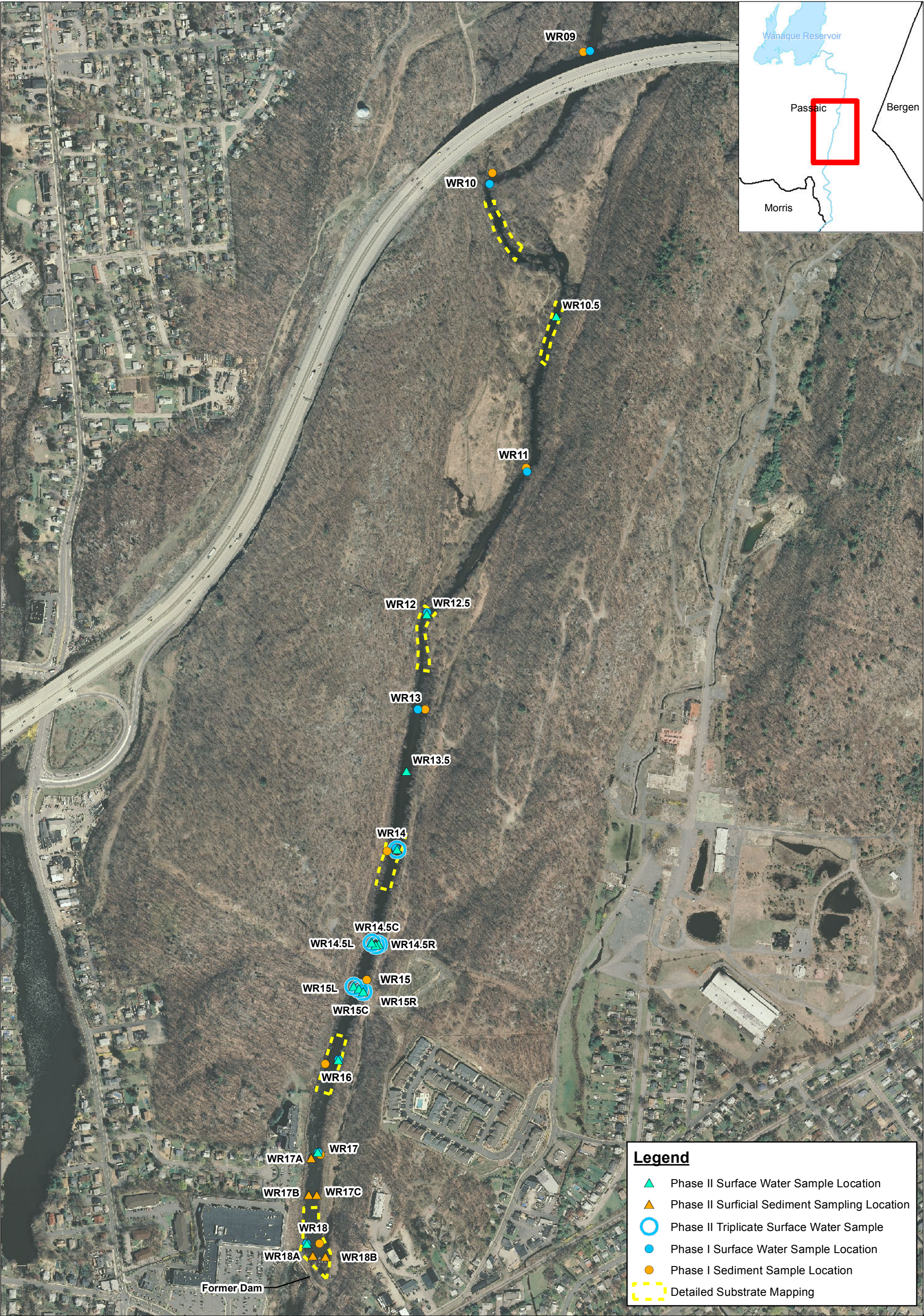


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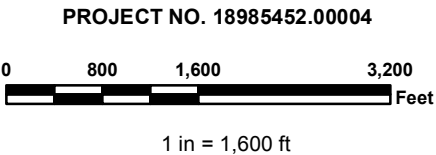


**Figure 5**  
**Reach 1 Sampling Locations - Phases I and II**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



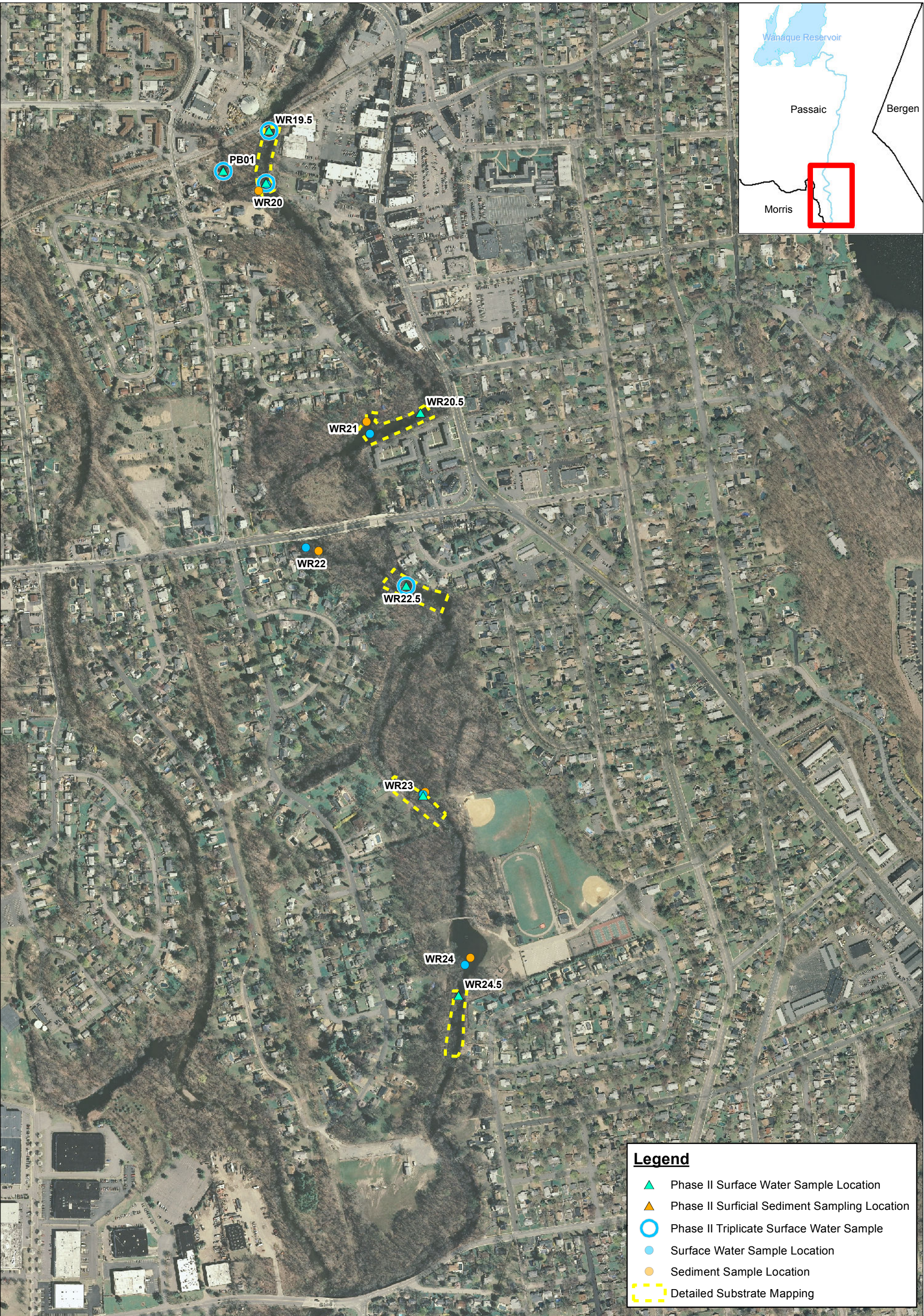


Source: Aerial Photography - NJDEP 2007

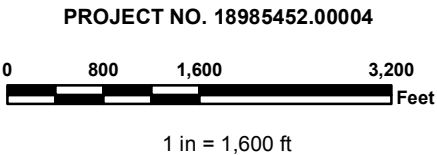


**Figure 6**  
**Reach 2 Sampling Locations - Phases I and II**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**





Source: Aerial Photography - NJDEP 2007

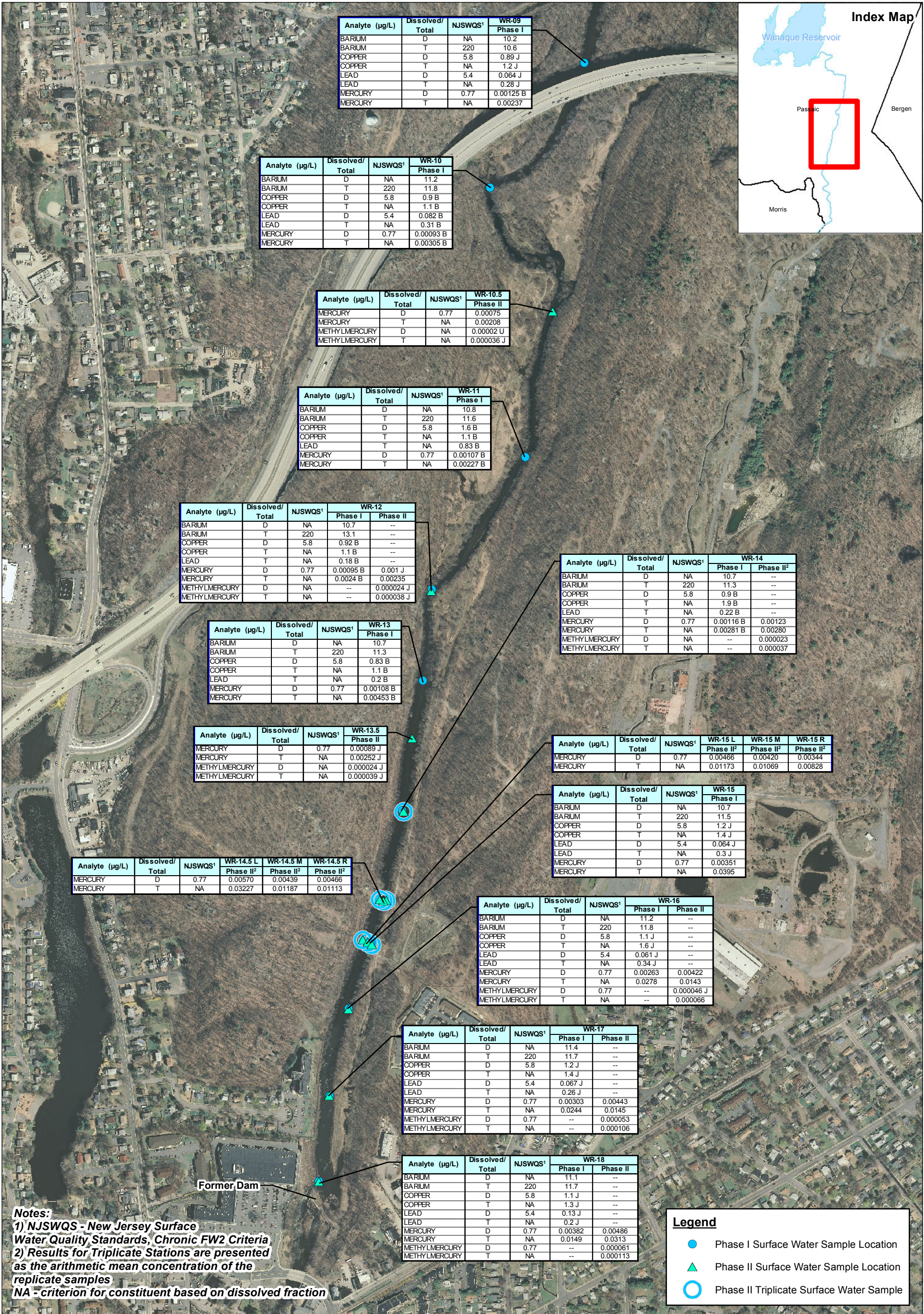


**Figure 7**  
**Reach 3 Sampling Locations - Phases I and II**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

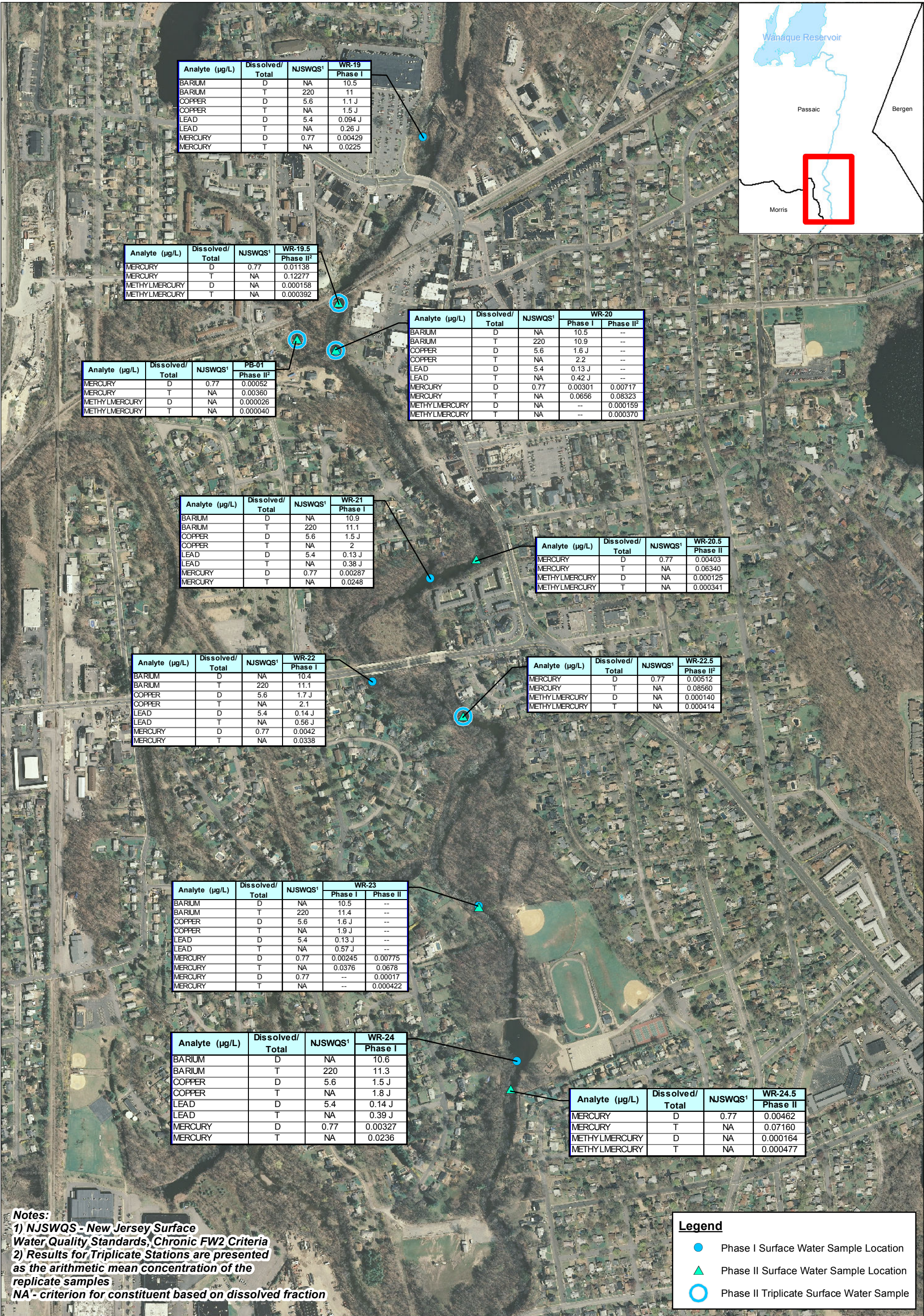




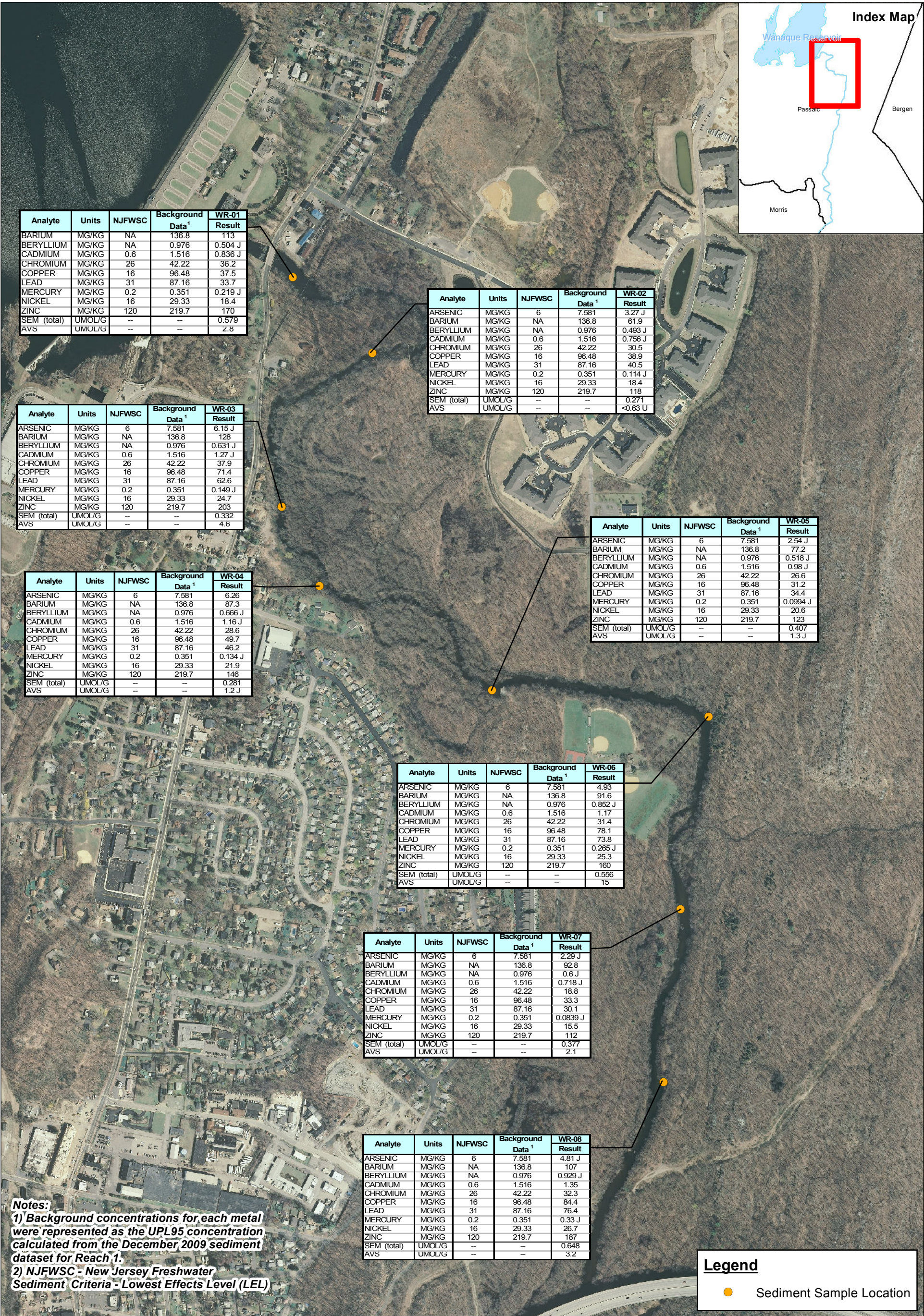








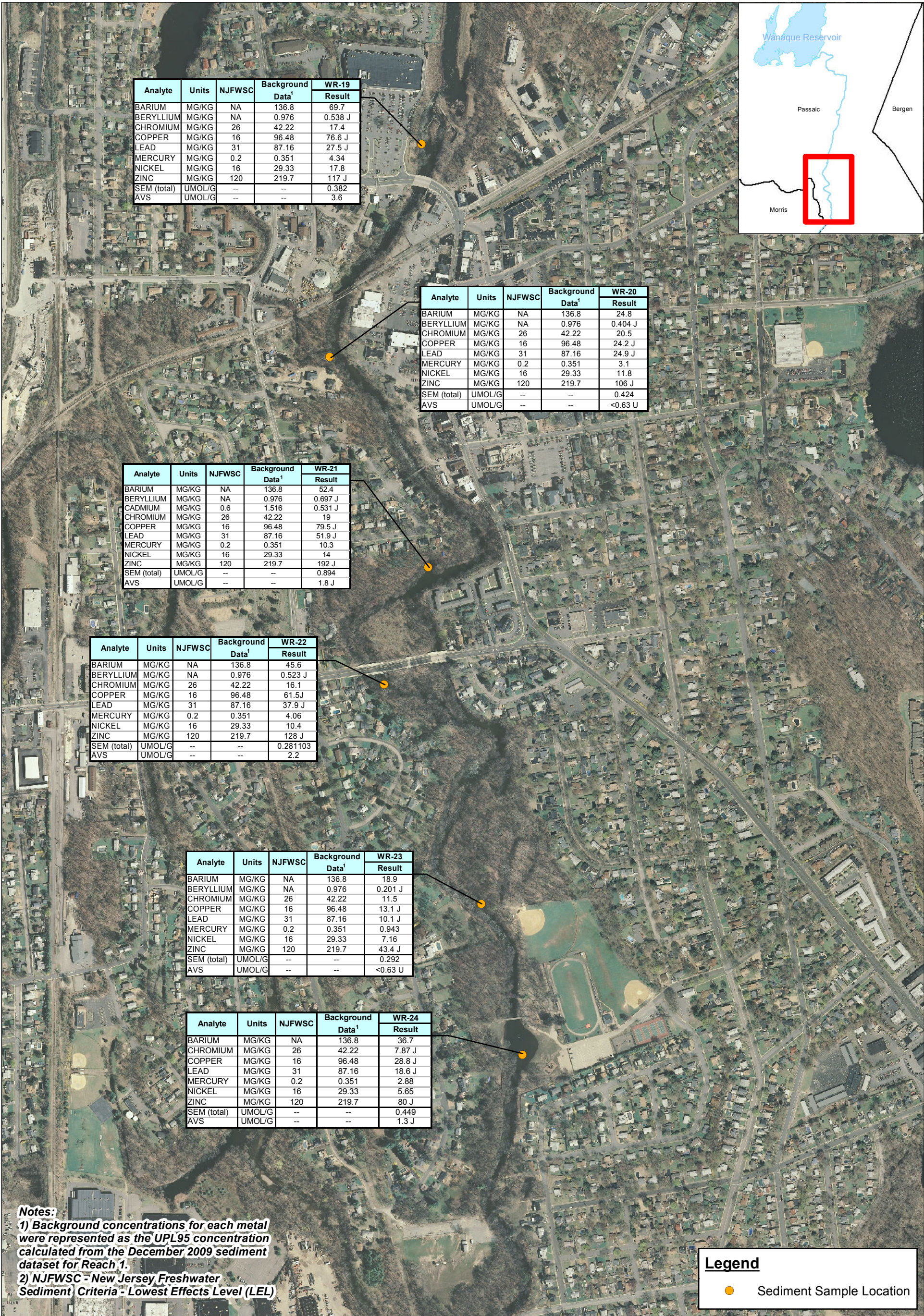




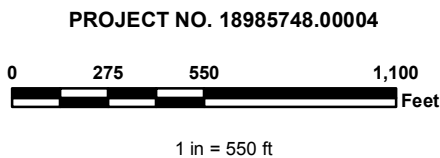








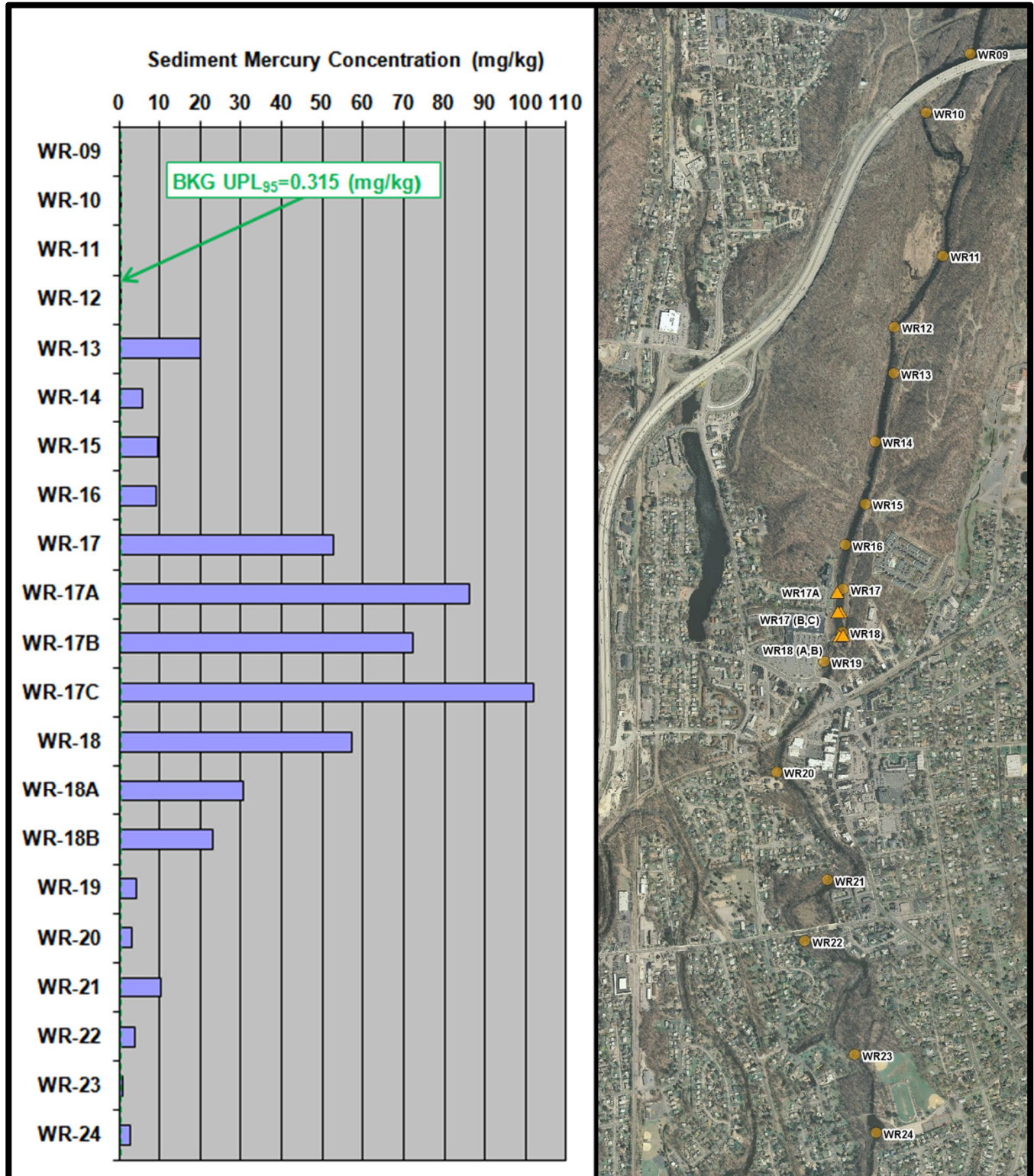
Source: Aerial Photography - NJDEP 2007



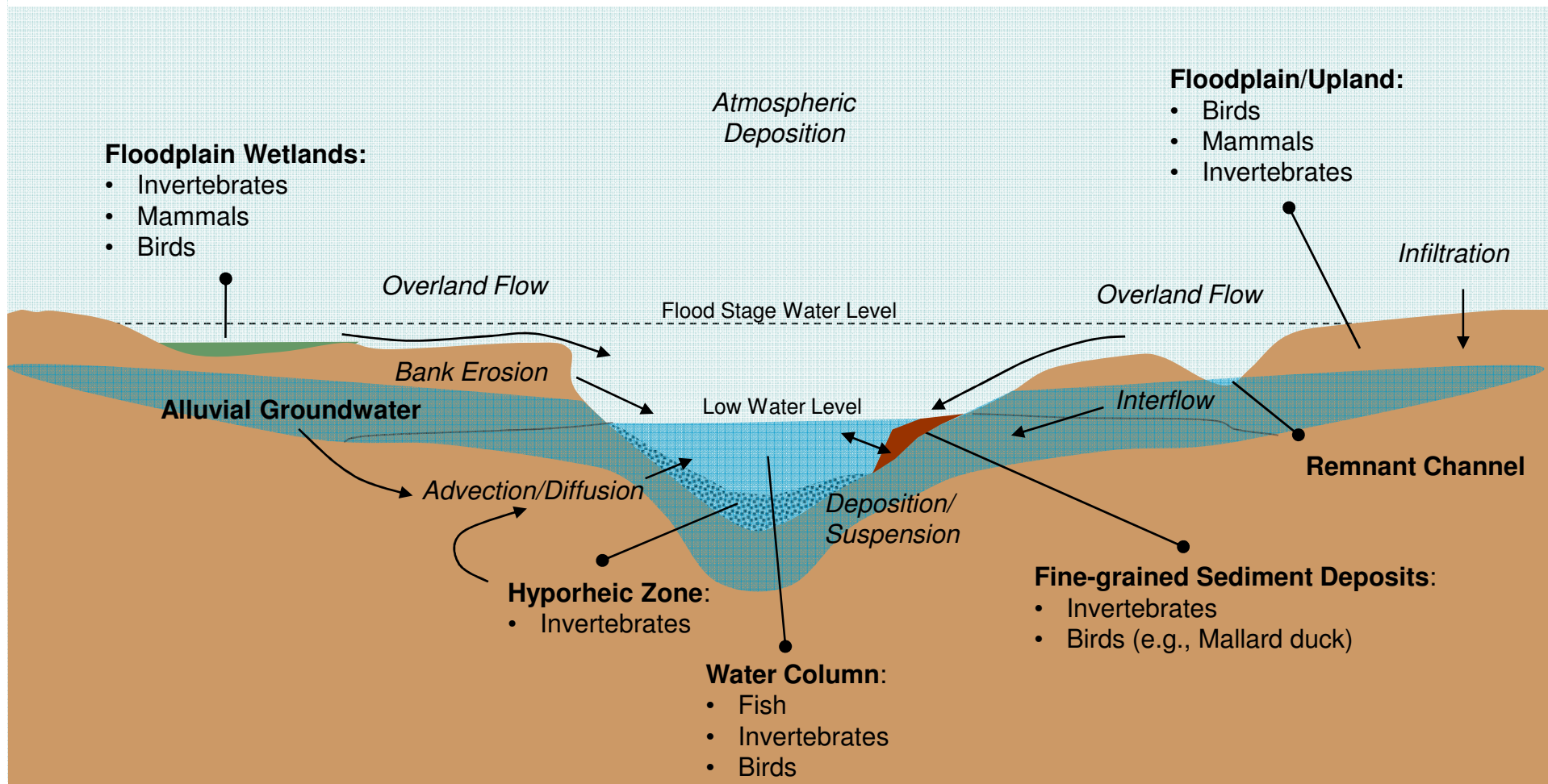
**Figure 13**  
**Detected Constituents in**  
**Sediment- Reach 3**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



Figure 14  
 Reaches 2 and 3 – Sediment Mercury Concentrations  
 Wanaque River Phase II Investigation  
 DuPont Pompton Lakes Site  
 Pompton Lakes, New Jersey

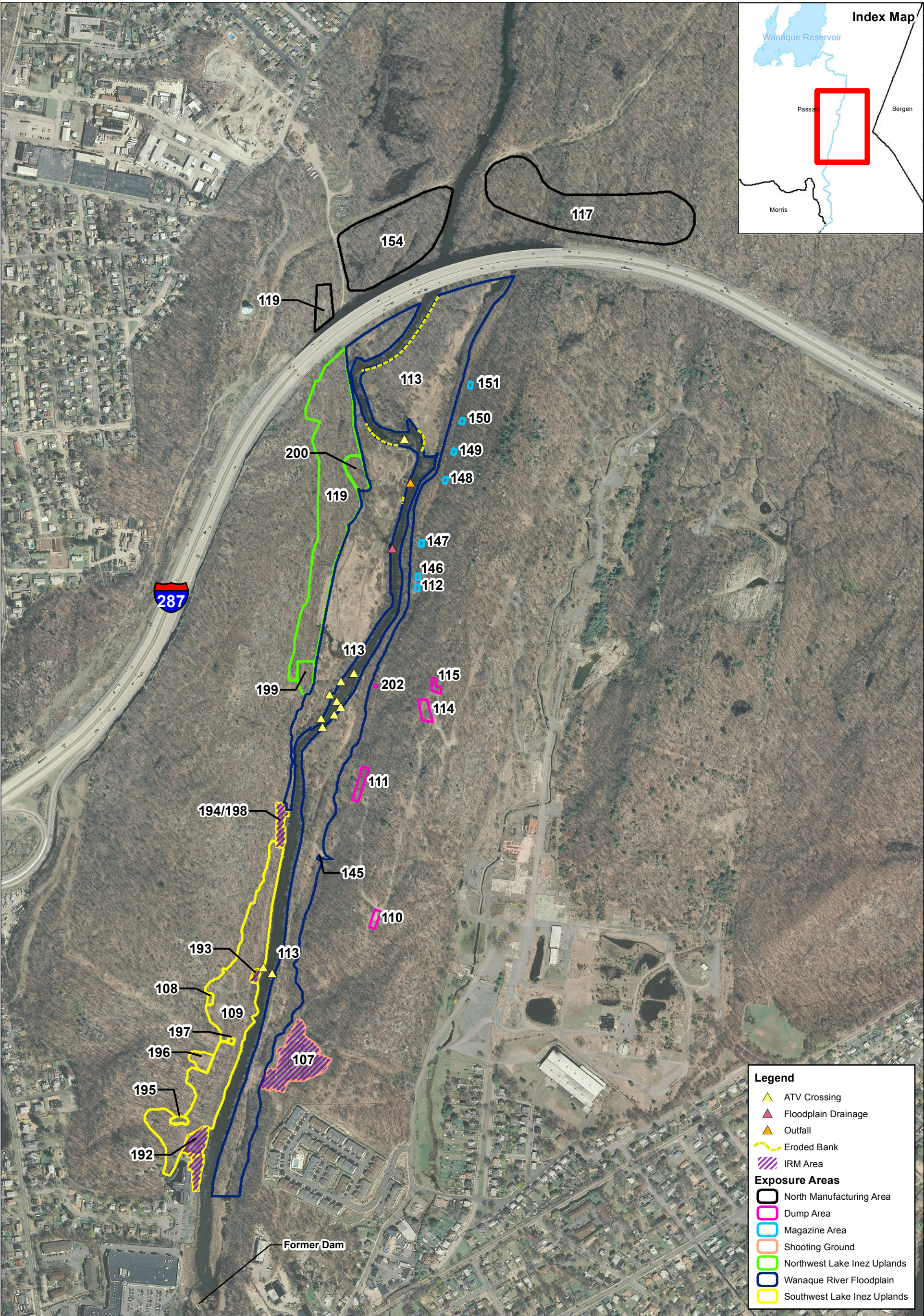


**Figure 15**  
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**Wanaque River Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

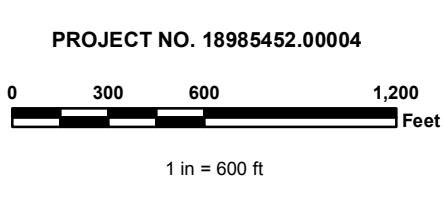


Note: Conceptual Site Model is a general representation of a fluvial system, including compartments that serve as ecological habitats and/or areas of constituents of potential ecological concern (COPECs). Compartments and potential example ecological receptors are bold, and mechanisms by which certain compartments may load COPECs to the system are in *italics*.





Source: Aerial Photography - NJDEP 2007



**Figure 16**  
**Bank Disturbances and**  
**Areas of Concern Within Reach 2**  
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**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



## **Appendices**

## **Appendix A**

### **Baseline Ecological Evaluation**

# Wanaque River Baseline Ecological Evaluation DuPont Pompton Lakes Works Pompton Lakes, New Jersey

Original Date: July 2010  
Revised Date: July 2011

Project No.: 18985452



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## Acronyms

Acronym/Abbreviation	Definition
AOC	Area of Concern
AVS	Acid volatile sulfides
BEE	Baseline Ecological Evaluation
BTAG	Biological Technical Assistance Group
CGWMP	Comprehensive Groundwater Monitoring Program
COPEC	Constituent of Potential Ecological Concern
CRG	Corporate Remediation Group
DERS	DuPont Environmental Remediation Services
EMA	Eastern Manufacturing Area
EPA	U.S. Environmental Protection Agency
ER-L	Effect Range-Low
ESBs	Equilibrium Partitioning Sediment Benchmarks
ESL	Ecological Screening Level
ESNR	Environmentally Sensitive Natural Resource
GWIIA	New Jersey Class IIA aquifer groundwater standards
HMW	High molecular weight
LEL	Lowest Effects Levels
LMW	Low molecular weight
MDL	Method detection limit
NJDEP	New Jersey Department of Environmental Protection
NJRDCSCC	New Jersey Residential Direct Contact Soil Cleanup Criteria
NJSWQS	New Jersey Surface Water Quality Standards
NJTRSR	New Jersey Technical Requirements for Site Remediation
NMA	Northern Manufacturing Area
NRD	Natural Resources Damage
NRWQC	National Recommended Water Quality Criteria
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PLW	Pompton Lakes Works
PPL	Priority pollutant list
PPL	Priority pollutant list
RASR	Remedial Action Selection Report
RBP	Rapid Bioassessment Protocol
RDCSRS	NJDEP Residential Direct Contact Soil Remediation Standards
RI	Remedial investigation
RIR	Remedial investigation Report
SEM	Simultaneously extracted metals
SVOCs	Semi-volatile organic compounds
TAL	Target analyte list
TOC	Total organic carbon
TSS	Total suspended solids
UPL <sub>95</sub>	Upper Probability Limit 95%
USACE	United States Army Corps of Engineers
USGS	U.S. Geological Survey
VOCs	Volatile organic compounds
WMA	Western Manufacturing Area

## Executive Summary

The New Jersey Department of Environmental Protection (NJDEP) Technical Requirements for Site Remediation (NJTRSR) requires that a baseline ecological evaluation (BEE) be performed for contaminated sites in New Jersey consistent with N.J.A.C. 7:26E-3:11. The purpose of this BEE is to ensure that potential contaminant migration pathways from upland areas of concern (AOCs) at the DuPont Pompton Lakes Works (PLW) site to the Wanaque River and the potential ecological effects to riverine biota are investigated and addressed as part of the remedial investigation process for the PLW site, located in Pompton Lakes, New Jersey.

This document represents a revision to the Wanaque River BEE submitted to the New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (EPA) on July 31, 2010. Revisions to the July 2010 BEE were based on comments provided by NJDEP in a memorandum dated October 26, 2010.

The scope of the Wanaque River BEE is an assessment to determine whether further sampling and investigation are necessary to evaluate potential risk to ecological receptors. The specific scope of work for the BEE includes identifying the co-occurrence of the following:

- Site-specific constituents of potential ecological concern (COPECs)
- Environmentally sensitive natural resources (ESNRs), with particular focus on the Wanaque River
- Potential contaminant migration pathways from upland AOCs to river ESNRs

The BEE evaluated the potential for impacts to Wanaque River biota through comparisons of COPEC concentrations in sediment and surface water to ecological benchmark and background levels. No COPECs were identified for surface water in the Wanaque River. Only mercury was identified as a COPEC in sediment based on exceedances of both ecological screening values and background levels.

ESNRs identified for the Wanaque River BEE include the Wanaque River and groundwater. The Wanaque River is designated by the NJDEP as trout production waters. Groundwater is evaluated in the BEE only in the context of its potential ecological impacts to the Wanaque River.

Contaminant migration pathways to the Wanaque River include stormwater runoff, bank erosion, and other potential direct loading processes from adjacent terrestrial and floodplain areas. Scour, re-suspension, and re-deposition are in-stream processes that may facilitate migration of COPECs to downstream areas. Groundwater migration to off-site surface-water resources is not a contaminant migration pathway of concern for ecological receptors.

Based on the presence of mercury at concentrations above sediment screening benchmark and background concentrations, additional sediment characterization is recommended to define mercury concentrations in Reach 2. Although site-related metals did not exceed benchmarks in Wanaque River surface-water samples collected from any of the three

reaches, additional surface-water sampling is recommended to augment the understanding of potential mercury transport and fate in the river.

These recommendations were implemented as part of Phase II sediment and surface-water investigations presented in Sections 4.2 and 6.2 of the July 2011 Remedial Investigation Report.

## 1.0 Introduction

The New Jersey Department of Environmental Protection (NJDEP) Technical Requirements for Site Remediation (NJTRSR) requires that a baseline ecological evaluation (BEE) be performed for contaminated sites in New Jersey consistent with N.J.A.C. 7:26E-3:11. The purpose of this BEE is to ensure that potential contaminant migration pathways from upland areas of concern (AOCs) at the DuPont Pompton Lakes Works (PLW) site to the Wanaque River and the potential ecological effects to riverine biota are investigated and addressed as part of the remedial investigation process for the PLW site, located in Pompton Lakes, New Jersey.

This document represents a revision to the Wanaque River BEE submitted to the New Jersey Department of Environmental Protection (NJDEP) and the U.S. Environmental Protection Agency (EPA) on July 31, 2010. Revisions to the July 2010 BEE were based on comments provided by NJDEP in a memorandum dated October 26, 2010.

Explosives and explosive products were manufactured at PLW from the late 1800s until 1994. Remedial investigations and activities have been ongoing at the site since 1988 to address areas potentially impacted by former site operations. For the purposes of the remedial investigation (RI), the site was divided into three manufacturing areas based on geography and operational history:

- Eastern Manufacturing Area (EMA), formerly referred to as the Acid Brook Valley
- Western Manufacturing Area (WMA), formerly referred to as the Wanaque River Valley
- Northern Manufacturing Area (NMA), formerly referred to as the Natural Resources Damage (NRD) Settlement Donation

Remedial Investigation Reports (RIRs) for these manufacturing areas were submitted to NJDEP in June 2010 (Parsons, 2010a; Parsons, 2010b, Parsons, 2010c, respectively). This BEE report addresses potential ecological impacts in the Wanaque River, which bisects the NMA and WMA, as it flows from north to south through the Wanaque River Valley.

### 1.1 Scope and Objective

The scope of the Wanaque River BEE is an assessment of potential risks to ecological receptors through an evaluation of complete contaminant migration pathways to the river from site areas containing surficial soils impacted by historical operations. The Wanaque River BEE is intended to support decisions regarding remedial strategies for the PLW site and satisfies the requirements of N.J.A.C. 7:26E-3:11 (NJDEP, 2010a). The specific scope of work for the BEE includes identifying the co-occurrence of the following:

- Site-specific constituents of potential ecological concern (COPECs)
- Environmentally sensitive natural resources (ESNRs), with particular focus on the Wanaque River

- Potential contaminant migration pathways from upland AOCs to river ESNRs

The primary objective of the BEE is to evaluate existing information and analytical data collected from the Wanaque River and adjacent areas to determine whether additional ecological investigation in the river may be appropriate.

## 2.0 Site Characterization

The following sections provide a detailed characterization of the Wanaque River and surrounding areas. The site characterization includes a description of the physical setting, historical operations associated with the WMA and NMA, and remedial investigations/activities implemented within the WMA and NMA to date.

### 2.1 Physical Setting

The PLW site is located in the boroughs of Pompton Lakes and Wanaque in central Passaic County in northern New Jersey. The site is visible on the United States Geological Survey (USGS) 7.5-minute Wanaque Quadrangle Map (see Figure 1 in the Wanaque River RIR). The site consists of northeast trending ridges and valleys containing two major drainage areas, the Wanaque River (former Lake Inez) to the west (340 acres), and the Acid Brook Valley to the east (230 acres). This BEE focuses on the Wanaque River and the portions of its drainage areas associated with the NMA and WMA portions of the PLW site.

The Wanaque River originates from the Wanaque Reservoir, approximately two miles due north of the northern boundary of the NMA and discharges into the Pequannock River at the Riverdale-Pompton Lakes municipal boundary. Water flow in the Wanaque River is controlled by the Raymond Dam, which forms the Wanaque Reservoir. The Wanaque River flows south through the NMA and WMA in a valley characterized by steep bedrock slopes along the east and west banks. Valley topography is relatively flat in the immediate vicinity of the river, with the flood plain widening considerably in the northern portion of the valley. Approximately 1.5 miles south of the WMA, the Wanaque River discharges to the Pequannock River.

Prior to 1984, the Wanaque River was impounded by a dam located near the southern boundary of the WMA and north of the Wanaque Avenue Bridge. The dam formed Lake Inez, which inundated low lying areas of the Wanaque River Valley. The United States Army Corps of Engineers (USACE) removed a portion of the dam in 1984, which resulted in the draining of Lake Inez and the return of the Wanaque River to its channel.

### 2.2 Historical Operations in the Wanaque River Valley

In the late 1800s, H. Julius Smith Blasting Cap Plant and the American Smokeless Powder Plant were operating in the Wanaque River (Lake Inez) Valley (henceforth referred to as the NMA and WMA). In 1902, DuPont built the Electric Exploder Company on the western side of Lake Inez and purchased the American Smokeless Powder Plant. In 1908, DuPont purchased the Smith Blasting Cap Plant and consolidated operations to the Electric Exploder Company, which was renamed DuPont Fuze Works. All DuPont operations ceased in the WMA in 1926; the Fuze Works was moved to the EMA and smokeless powder operations were transferred to other DuPont facilities. DuPont operations in the EMA generated a variety of explosives and explosive products until April 1994, when the facility was closed.



## 2.3 Previous Investigation and Activities

The following sections summarize previous investigations and activities conducted in the Wanaque River and the adjacent floodplain.

### 2.3.1 Surface Water and Sediment

In April and October of 1990, surface-water samples were collected from the southern portion of the site and south of the site [DuPont Environmental Remediation Services (DERS), 1995]. Unfiltered surface-water samples were analyzed for metals, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). Samples were collected from three locations that were co-located with sediment sampling locations: 501, 502, and 503. One additional location, 500, was sampled in October 1990.

In 1990, maximum concentrations of mercury and barium exceeded freshwater benchmark concentrations. Acetone, methylene and bis(2-ethylhexyl)phthalate were the only VOCs or SVOCs detected in surface water; all three constituents were detected at concentrations below ecological benchmark concentrations. No PAHs or PCBs were detected in surface water. Based on the 1990 surface-water data, site-related metal constituents were targeted for surface-water investigations in December 2009.

In April and October 1990, sediment samples were collected from the Wanaque River at the southern portion of the site and south of the site. Samples were collected from the surficial layer, 0 to 0.5 foot in depth. Analyses included metals, VOCs, PAHs, SVOCs, and PCBs. Samples were generally collected from three locations 501-3, 502-3, and 503-3, with the exception of copper, lead, and mercury, which were sampled at these three locations plus an additional 10 locations.

In the 1990 dataset, maximum detected concentrations of copper, lead, and mercury, exceeded conservative ecological benchmark concentrations for sediment. Two SVOCs, bis(2-ethylhexyl)phthalate and di-n-butyl phthalate, were detected in sediment but did not exceed the ecological benchmark concentrations; no other VOCs, SVOCs, PAHs, or PCBs were detected in sediment. Based on the evaluation of 1990 sediment data, site-related metal constituents were targeted for sediment investigations in December 2009. The results of these investigations are discussed in Section 4.3.

### 2.3.2 Adjacent Terrestrial and Wetland Soils

In addition to sediment and surface-water investigations within the river, extensive investigations have been conducted in the adjacent floodplain. The following sections describe activities in on-site and off-site portions of the floodplain.

#### On-Site

Extensive investigations of site-related constituents in upland and floodplain soils within the NMA and WMA have been conducted as part of on-going remedial investigations of the PLW site. Detailed descriptions of these investigations have been reported in RIRs for the NMA and WMA (Parsons, 2010a and 2010b, respectively). BEEs submitted as part of these RIRs evaluated the concentrations of site-related constituents in surficial soils in

AOCs identified in the NMA and WMA. AOCs in the NMA (AOCs 117 and 119) were evaluated collectively. For the WMA, AOCs were grouped into six exposure areas according to geographic location and similarity of historical operations (see Figure 16 in the Wanaque River RIR):

- Northwest Lake Inez Uplands
- Magazine Area (Northeast Lake Inez Uplands)
- Dump Areas
- Shooting Areas
- Southwest Lake Inez Uplands
- Wanaque River Floodplain

The BEEs identified site-related metals as the primary COPECs in surficial soils from the NMA and WMA. COPECs were identified based on comparisons of measured concentrations to ecological benchmark concentrations for soil (Parsons, 2010a and 2010b, respectively). In the NMA, six metals (arsenic, copper, lead, mercury, selenium, and zinc) and high molecular weight (HMW) PAHs were identified as COPECs in surficial soils; lead was identified as the primary COPEC in NMA soils based on the frequency and magnitude of exceedances of ecological benchmark concentrations and ambient soil concentrations..

The WMA BEE identified multiple metals and HMW PAHs as COPECs in surficial soils (Parsons, 2010b). Of these COPECs, mercury, copper, and lead were reported in the greatest concentrations relative to ecological benchmark concentrations. Mercury concentrations in surficial soils were greatest in the Southwest Lake Inez Upland Area (AOC 109) and southern portions of the Wanaque River floodplain (AOC 113 opposite AOC 109); mercury concentrations were lowest in the Magazine Area, the Northwest Lake Inez Uplands, and the northern portion of the Wanaque River floodplain (see Figure 16 in the Wanaque River RIR).

### **Off-Site**

In addition to investigations of soils within the former manufacturing areas, extensive investigations and remediation of floodplain soils have been conducted in off-site areas downstream of the site. From 1990 to 1992, characterization sampling of off-site soils was conducted in the Wanaque River floodplain from the downstream site boundary to the confluence of the Pequannock River. Based on characterization sampling, floodplain soils were horizontally and vertically delineated to New Jersey Residential Direct Contact Soil Cleanup Criteria (NJRDSCC) that were current at the time of the investigation from 1998 to 1999. The primary constituents identified for delineation sampling included mercury and lead, in addition to copper and select SVOCs. The findings of the investigation indicated that lead and mercury were confined to the upper 24 inches of soil at select locations within the 100-year floodplain. A total of 15 remedial projects were completed off-site to remove soils exceeding remediation criteria. These projects resulted in the removal of approximately six acres of the Wanaque River floodplain, which were replaced with clean fill.

Based on the evaluation of upland and floodplain soils adjacent to and downstream from the PLW site, in addition to the results of previous investigations of sediment and surface water in the Wanaque River (see Section 2.3.1), site-related metals are the primary constituents of concern. Of the site-related metals, mercury, copper, and lead are identified as the primary constituents concern; these metals were measured at the greatest concentrations in surficial upland and floodplain soils relative to ecological benchmark and ambient soil concentrations.

An evaluation of the Wanaque River floodplain was conducted as part of a qualitative habitat survey in November 2009 and surface-water and sediment sampling in December 2009. The survey and sampling efforts supported an assessment of potential sources and migration pathways of COPECs from the NMA and WMA to the river and identified floodplain characteristics, including eroding banks, drainage channels, or other disturbances that may be important features in potential transport pathways from adjacent upland and floodplain areas. Results of soil sampling conducted in the Wanaque River floodplain are discussed in Section 6.1.

### 3.0 Environmental Setting

The environmental setting of the Wanaque River is described in the following sections. Descriptions of the river and surrounding cover types are based on observations made by experienced ecologists during November 2008 and December 2009 reconnaissance of the site.

#### 3.1 Wanaque River

The Wanaque River bisects the NMA and WMA, flowing from north to south. Within the WMA and NMA, the Wanaque River width is variable ranging from approximately 40 feet wide in the northern portion to 50 feet wide in the center of the project area to 25 feet or less in the southern area near the former dam. The river is relatively shallow with depths generally less than 2 feet.

Aquatic habitat in the Wanaque River varies from the Wanaque Reservoir upstream of the site to the confluence of the Pequannock River downstream of the site. Upstream of the site and for the northern two-thirds of the on-site reach, the river is characterized by riffle/run/pool complexes. Flow in the southern third of the on-site reach is influenced by the remnants of the former dam. In this reach, the channel broadens, water velocity is reduced, and the river is characterized primarily by pool habitats. Downstream of the former dam, the river returns to the riffle/run/pool structure observed upstream of the site.

Consistent with these changes in hydrology, substrates also vary throughout the reaches. In areas characterized by riffle/run/pool complexes, depositional sediments are typically limited to the channel margins and backwater depositional features. In the slower, pool habitat that characterizes the lower third of the on-site reach, sediment accumulates across the channel resulting in highly embedded substrates.

#### 3.2 Adjacent Terrestrial and Wetland Areas

Deciduous forests are the predominant coertype in the WMA and NMA; this habitat comprises the matrix habitat within which all other habitat types exist. Other terrestrial/wetland habitats that exist within the forest matrix include mixed forested/scrub-shrub habitat on the floodplain of the Wanaque River and emergent, forested and/or riverine wetlands.

Deciduous forests characterize the hill slopes and ridge tops within the NMA and WMA. Steep slopes and numerous bedrock outcroppings characterize these deciduous forested habitats. Common tree species include white oak (*Quercus alba*), red oak (*Quercus rubra*), chestnut oak (*Quercus prinus*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), conifers, and American beech (*Fagus grandifolia*). These species are widespread from the bottom of the slope to the tops of the ridges; at the tops of the ridges and along the eastern side of the ridge, mountain laurel (*Kalmia latifolia*) is a common understory species.

The Wanaque River floodplain and the former Lake Inez bed are approximately 2 to 5 feet higher in elevation compared to the Wanaque River. The floodplain substrate

consists of a mixture of sand and clay. Vegetation consists of a mix of forested and scrub-shrub habitats. Canopy species in these areas include red maple, river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), black cherry (*Prunus serotina*), and green ash (*Fraxinus pennsylvanica*).

The floodplain area in the downstream portion of the on-site reach near the old dam consists of wetland vegetation such as *Phragmites* sp., purple loosestrife (*Lythrum salicaria*), and other herbaceous species. Hydric soil within this area is predominantly clay.

### 3.3 Groundwater

Water depths measured in wells in the NMA and WMA portions of the PLW site ranged from approximately 8 to 19 feet below ground surface [DuPont Corporate Remediation Group (CRG), 2004]. The saturated thickness of the alluvial aquifer ranges from approximately 32 feet in the mid-valley to 47 feet near the former Lake Inez dam at the south. The alluvial deposits comprise a single aquifer system in that no layer of low permeability was found that would act as a confining unit. However, for the purposes of analytical monitoring, the alluvium was divided into two zones: shallow and deep.

Depth to groundwater in the exposed bedrock zone may fluctuate on-site from 2 to 5 feet, in response to seasonal precipitation (Golder Associates, 1988). Based on the September 13, 2004 data, the groundwater flow direction in the alluvium is generally south, and the approximate horizontal gradient is 0.001 ft/ft (Parsons, 2010c).

## 4.0 Constituents of Potential Ecological Concern

Sediment and surface-water investigations have been conducted in the Wanaque River to characterize the concentrations of constituents potentially related to the PLW site. For the BEE, existing environmental data were evaluated relative to ecological benchmark concentrations to identify COPECs.

### 4.1 Data Evaluation

This BEE evaluates potential ecological exposures to surface water and sediment in the Wanaque River. Surface-water and sediment samples were collected in December 2009 to provide data representative of current conditions in the river, and to characterize concentrations of COPECs from reaches of the river upstream, within, and downstream of the site boundary. The sediment and surface-water data results will ultimately be used to determine the need for additional ecological investigation in the Wanaque River.

Placement of sampling locations was determined from the results of a qualitative habitat characterization conducted in November 2009 that focused on identifying potential migration pathways of COPECs to the river and characterizing the aquatic/riparian habitat and notable biological attributes. These samples were collected from 24 stations in three reaches of the Wanaque River:

- Reach 1: Extends approximately 2.0 miles from downstream of the Wanaque Reservoir to the upstream site property boundary. This reach is considered representative of regional background conditions.
- Reach 2: Extends approximately 1.5 miles from the upstream site boundary to the location of the former dam that formed Lake Inez.
- Reach 3: Extends approximately 1.3 miles downstream of the former dam. Sediment and surface-water data collected from this reach are used to evaluate the extent of potential downstream migration of COPECs.

Sediment sample locations were in large part co-located with surface-water samples. In some instances, sediment samples were spaced a few feet away from designated sample locations due to the presence of coarse substrates at the original location, which were unsuitable for achieving sample data quality objectives. December 2009 sediment and surface-water sample locations are presented in Figures 1 through 3.

Although groundwater is not an ecological medium of concern, it is a medium by which COPECs may potentially migrate from source areas. Groundwater was therefore evaluated in the BEE as a potential migration pathway to surface water and sediment in the Wanaque River.

The following sections describe the available surface-water, sediment, and groundwater datasets evaluated in the BEE.

### 4.1.1 Surface Water

A total of 24 surface-water samples were collected: eight in Reach 1, 10 in Reach 2, and six in Reach 3. Surface-water samples were analyzed for targeted metals identified during a preliminary identification of COPECs in site media, including soil, sediment, and surface water. Targeted metals included antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, selenium, silver, thallium, and zinc. These targeted metals were analyzed in filtered and unfiltered samples. Additional analytes measured in unfiltered samples include total hardness and total suspended solids (TSS).

### 4.1.2 Sediment

Sediment samples were collected in December 2009 from 24 stations within the Wanaque River, generally co-located with the surface-water samples described above. Sediment samples were collected from the 0 to 0.5-foot interval from depositional features along the channel margins or in backwater areas. Sediment samples were analyzed for targeted metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, selenium, silver, thallium, and zinc), simultaneously extracted metals (SEM), acid volatile sulfides (AVS), total organic carbon (TOC) and grain size.

### 4.1.3 Groundwater

Groundwater was evaluated as part of the Lake Inez Groundwater Investigation (DuPont CRG, 2004). In November 2002, the Lake Inez alluvial wells (141-D, 142-S, 142-D, 143-S, and 143-D) were sampled for the 10 site-specific VOCs defined in the Comprehensive Groundwater Monitoring Plan. The alluvial wells were sampled again in May 2003 for priority pollutant list (PPL) VOCs and target analyte list (TAL) metals as per an April 16, 2003 letter from NJDEP. Two additional shallow wells were installed in 2005 to delineate the copper in well 142-S; these wells were sampled in December 2005 and August 2006. The results are discussed in detail in the Site Investigation Groundwater Report, December 2004 (DuPont CRG, 2004).

## 4.2 Ecological Benchmark Concentrations

Published ecological benchmark concentrations were used to evaluate the existing site analytical data. An exceedance of the conservative benchmark provides an initial indication that the constituent may be of potential ecological concern. Ecological benchmarks were not identified for essential nutrients, including calcium, magnesium, potassium, and sodium. The EPA advises that calcium, magnesium, sodium, and potassium typically do not pose ecological risk (EPA 2001). As a result, further evaluation of these metals is not warranted in the BEE.

The following sections present a description of ecological benchmark concentrations used to evaluate constituent concentrations in surface-water, sediment, and surficial soil datasets.

### 4.2.1 Surface Water

Ecological benchmark concentrations for surface water were based on ecological screening values selected from the following sources:

- New Jersey Surface water Quality Standards (NJSWQS) – freshwater chronic aquatic life protection criteria, FW2-NT (NJDEP, 2010b)
- National Recommended Water Quality Criteria (NRWQC) – chronic aquatic life protection criteria (EPA, 2009)
- EPA Region III Biological Technical Assistance Group (BTAG) freshwater screening benchmarks (EPA, 2006a)

### 4.2.2 Sediment

Ecological benchmark concentrations for sediment were based on ecological screening values and background concentrations. For metals, ecological benchmark concentrations were based on the higher of the ecological screening values and background concentrations. The following sections describe the sources of ecological screening values and background concentrations.

#### Ecological Screening Values

Sediment screening values included the following benchmarks recommended by the NJDEP in its *Guidance for Sediment Quality Evaluations* (NJDEP, 1998):

- Ontario Ministry of the Environment Lowest Effects Levels (LEL) for freshwater sediment-dwelling organisms (Persaud et al., 1993)
- Effects Range-Low (ER-L) concentrations for marine/estuarine organisms (Long et al., 1995)

It should be noted that these benchmarks are considered to be conservative. They are based on a ranking of data obtained from numerous sources for which a biological effect was observed in conjunction with an elevated constituent concentration. These types of screening concentrations provide little information on the bioavailability or toxicity of a particular constituent and assume that a direct causal relationship exists between constituent concentrations detected in a sample and observed effects on the biota in the sample. Both benchmarks also assume the ability to discriminate the importance of a single constituent to the observed biological effects even though the sediment sample may contain multiple substances.

For constituents without LELs or ER-Ls, alternative screening concentrations were used from the following sources:

- EPA Region III BTAG freshwater sediment screening benchmarks (EPA, 2006b)
- EPA Region 5 Ecological Screening Levels (ESLs) for sediment (EPA, 2003)



## Background Concentrations

Sediment benchmark concentrations for metals were also based on background sediment concentrations measured in Reach 1 during the December 2009 surface-water and sediment investigation. Background concentrations for each metal were represented as the UPL<sub>95</sub> (Upper Probability Limit) concentration calculated from the December 2009 sediment dataset for Reach 1.

## 4.3 Identification of COPECs

COPECs were identified if the maximum detected concentration of the constituent exceeded the conservative ecological benchmark concentrations. In addition to comparisons with ecological benchmarks, other factors were considered in the identification of COPECs, including background concentrations, frequency of detection/exceedance of benchmarks, site-relatedness of chemicals, the bioavailability of metals in sediment, and the potential for constituents to bioaccumulate. For an inorganic constituent to be identified as a sediment COPEC, the maximum concentration must exceed both the ecological benchmark concentration and the background concentration. The bioavailability of divalent metals in sediment based on partitioning to AVS and TOC was also considered in the identification of sediment COPECs (EPA, 2005). In surface water, constituents were identified as COPECs only if the concentration measured in the filtered sample exceeded the ecological benchmark concentration. Non-detected constituents and their corresponding detection limits are not included in the BEE; these data are provided in the Wanaque River RIR.

Surface-water and sediment samples were collected from the Wanaque River in 1990 and 2009. For the purposes of the Wanaque River BEE, the results of the 2009 sampling event were used as the basis for identifying COPECs because these data are most representative of current conditions in the Wanaque River. The following sections present the evaluation of surface-water and sediment data and identify COPECs for the Wanaque River.

### 4.3.1 Surface Water

In the 2009 surface-water dataset, barium, copper, lead, and mercury were the only metals were detected in surface water; the four metals were detected in all three site reaches (see Table 1). Maximum concentrations of these metals samples did not exceed ecological screening values in filtered or unfiltered samples (see Table 1). Based on the results of the 2009 surface-water investigation, no COPECs were identified for surface water in the Wanaque River.

### 4.3.2 Sediment

In the 2009 sediment investigation, 10 metals were detected in sediment collected from Reach 1, Reach 2, and Reach 3 (see Table 2). Of the 10 detected metals in Reach 2, maximum concentrations of arsenic, beryllium, copper, lead, mercury, and zinc exceeded both the ecological screening value and background data; the maximum concentration of mercury exceeded the ecological screening value and background data in Reach 3.

Arsenic, beryllium, copper, lead, and zinc are not retained as sediment COPECs based on the frequency of exceedance of ecological benchmark concentrations. A summary of the lines of evidence for excluding arsenic, beryllium, copper, lead, and zinc as sediment COPECs is provided in Table 3. Maximum concentrations of arsenic and beryllium slightly exceeded background UPL<sub>95</sub> concentrations at one location for each constituent (see Table 3). As a result, arsenic and beryllium are not retained as sediment COPECs. Of the 10 stations sampled in Reach 2, copper and lead exceeded background UPL<sub>95</sub> concentrations in at three and two stations, respectively. Zinc concentrations exceeded the background UPL<sub>95</sub> at two stations and were comparable to the background UPL<sub>95</sub> concentration at a third station (see Figure 2).

In addition to the limited frequency of exceedance, copper, lead, and zinc are not identified as COPECs based on the limited bioavailability of these divalent metals in Reach 2 sediments. The bioavailability, and thus the potential toxicity, of divalent metal COPECs can be estimated by the AVS present in sediment. The combination of AVS and SEM forms insoluble metal-sulfides that are not biologically available for uptake by benthic organisms (Di Toro et al., 1992; Ankley et al., 1996; and Berry et al., 1996). Normalizing SEM:AVS results by TOC considers the additional capacity of sediment organic carbon to bind divalent metals, in addition to the metal-binding of capacity to sulfides. Consistent with EPA (2005), the combined binding capacity of TOC and AVS was considered based on the following relationship:  $SEM-AVS/f_{oc}$ . Based on survival data from sediment toxicity testing, EPA (2005) reported that  $SEM-AVS/f_{oc}$  values less than  $130 \mu\text{mol}/g_{oc}$  were unlikely to result in toxicity, while toxicity was likely to occur values  $SEM-AVS/f_{oc} > 3,000 \mu\text{mol}/g_{oc}$ ; toxicity at values in between these thresholds were uncertain (EPA, 2005).

Based on the partitioning of divalent metals to AVS and TOC, copper, lead, and zinc are not anticipated to be bioavailable in depositional sediments in Reach 2 at concentrations likely to adversely affect benthic invertebrate receptors.  $SEM-AVS/f_{oc}$  values calculated for the 10 stations in Reach 2 were comparable to or less than 0 (see Figure 4 and Table 3). Since these values were lower than the  $130 \mu\text{mol}/g_{oc}$  threshold, it is unlikely that concentrations of divalent metals in sediments from Reach 2 will result in toxicity to benthic invertebrate receptors. Based on the limited exceedances of the background UPL<sub>95</sub> and the limited toxicity predicted by TOC-normalized SEM:AVS results, copper, lead, and zinc are not identified as COPECs in Wanaque River sediment.

Based on this the results of the sediment evaluation, mercury is the only COPEC identified in Wanaque River sediments.

## 5.0 Environmentally Sensitive Natural Resources

ESNRs were identified at the site based on the definition provided in N.J.A.C. 7:26E-1.8. The Wanaque River is the primary ESNR addressed in the BEE. In addition, pursuant to 2010 amendments to N.J.A.C. 7:26E-1.8, groundwater within the NMA and WMA is also considered an ESNR. The following section provides a brief description of the relevant ESNRs for this BEE.

### 5.1 Wanaque River

The Wanaque River is a shallow stream that flows in a southerly direction through the center of the town of Pompton Lakes and parallel to Acid Brook. The river originates from the Wanaque Reservoir approximately 2.5 miles north of Pompton Lake, and flows into the Pequannock River south of the site. The Wanaque River is designated by the NJDEP as a FW2-TPC1 stream (NJDEP, 2009), meaning that the river is a freshwater stream not designated as pineland water or FW1 waters as designated in N.J.A.C. 7:9B-1.15(h). It is also considered a category one trout production stream, which means that the waters are designated for trout spawning or nursery purposes and the waters are protected from measurable changes in water quality.

### 5.2 Groundwater

Groundwater does not represent an ecological exposure medium but can be a potential transport medium of constituents from source areas. Investigations of the groundwater quality in the WMA have been conducted periodically as part various site investigations, including the Comprehensive Groundwater Monitoring Program (CGWMP), and are discussed further in Section 6.2. In this BEE, groundwater is evaluated in the context of its potential ecological impacts to the Wanaque River.

## 6.0 Contaminant Migration Pathways

This section identifies potentially complete migration pathways between COPECs and ESNRs associated with the riverine systems potentially influenced by the site.

Stormwater runoff and erosion from deciduous uplands in the Wanaque Valley and from the associated Wanaque River floodplain are potential pathways for COPECs to migrate to the Wanaque River. The evaluation of the completeness of potential contaminant migration pathways for the Wanaque River BEE is based primarily on comparisons of surficial soil, sediment, and surface-water data to conservative ecological benchmark concentrations (see Section 4.3) to identify COPECs. Observations taken during reconnaissance-level surveys and prior investigations of the site uplands and floodplain areas were also used to evaluate the potential for COPECs to migrate to river system ESNRs. The presence of site-related COPECs in environmental media within ESNRs is indicative of complete contaminant migration pathways from site activities to ESNRs.

### 6.1 Stormwater Runoff/Erosion

As discussed in Section 2.3.2, analytical data from samples collected from upland AOCs (Northwest Lake Inez Uplands, Magazine Areas, Dump Grounds, Shooting Areas, and Southwest Lake Inez Uplands) indicate elevated concentrations of site-related constituents in surficial soils in the forested uplands, an area designated as a terrestrial ESNR in the WMA BEE (URS, 2010). In surficial soils collected from upland AOC exposure areas, maximum concentrations of a group of metals exceeded ecological benchmark concentrations and 90<sup>th</sup> percentile ambient soil (background) levels (Sanders, 2003). Copper, lead, and mercury exceeded benchmarks most frequently and had the highest concentrations relative to benchmarks. HMW PAHs also exceeded ecological benchmark criteria in four exposure areas, Northwest Lake Inez Uplands, Dump Areas, and Southwest Lake Inez Uplands. In addition, low molecular weight (LMW) PAHs exceeded ecological benchmark criteria in the Southwest Lake Inez Uplands (URS, 2010). Based on these analytical findings, it was concluded that a potentially complete contaminant migration pathway exists between the WMA and the forested upland ESNR.

Soil COPECs identified in the surface soils of the forested area may be transported to downgradient wetlands or surface-water bodies via surface-water runoff, tributary discharge, and bank erosion. Based on the evaluation of floodplain soils data, a potentially complete migration pathway exists to the floodplain. The maximum concentration of eight metals, arsenic, cadmium, chromium, copper, lead, mercury, selenium, and zinc exceeded ecological benchmark criteria and 90<sup>th</sup> percentile ambient soil levels. Mercury had the largest number of exceedances which predominately occurred in the southern portion of the site. HMW PAHs also exceeded the ecological benchmark criteria in the floodplain (URS, 2010).

As indicated previously, the Wanaque River floodplain bed is approximately 2 to 5 feet higher in elevation compared to the Wanaque River. Surface-water runoff through the floodplain and erosion caused by high water conditions in the Wanaque River could potentially physically transport soil containing COPECs from the floodplain

soils/sediment into the adjacent Wanaque River. Sediment transport, entrainment, and deposition are other mechanisms capable of facilitating the transport of floodplain COPECs to the adjacent Wanaque River.

Surface-water data collected from the three reaches along the Wanaque River indicate that metals were detected at concentrations below the ecological benchmark criteria. The evaluation of Wanaque River sediment at locations in the southern portion of the site and south of the site indicate that arsenic, beryllium, copper, lead, mercury, and zinc exceed ecological benchmarks. As discussed in Section 4.3.2, arsenic and beryllium are not considered COPECs given concentrations similar to background levels. Copper, lead, and zinc are also not identified as COPECs owing to the low bioavailability potential of these metals.

The presence of mercury in sediment above screening and background concentrations suggests the contaminant migration pathway from upland AOCs to the Wanaque River via the floodplain is potentially complete. Scour of the Wanaque River bottom during periods of high flow may in turn liberate COPECs from Wanaque River sediments to the overlying water column, where river currents may potentially transport and re-deposit COPECs further downstream.

## 6.2 Groundwater Migration

Based on the analytical results from historical groundwater sampling conducted in the WMA, it is concluded that the groundwater migration pathway to surface water is incomplete. Evaluation of data from wells located in the lower portion of the valley indicated that copper was the only constituent detected above New Jersey Class IIA aquifer groundwater standards (GWIIA); VOCs were not detected above the method detection limit (MDL). Copper concentrations in groundwater that exceeded the GWIIA of 1,000 µg/L were believed to be associated with copper wire found in AOC 192, which was remediated in 1996. The copper exceedance was delineated in groundwater and found to be of limited extent; it was also determined that copper was not migrating with groundwater (Parsons, 2010c). Copper concentrations in the Wanaque River prior to the remediation of AOC 192 were below the MDL of 10 µg/L, indicating that elevated concentrations of copper in groundwater were not observed in the river. Maximum copper concentrations in surface-water samples collected in Reach 2 during the December 2009 investigation were 1.9 µg/L and 1.6 µg/L for unfiltered and filtered samples, respectively (see Section 4.3.1). Based on this evaluation, groundwater does not appear to be a significant contaminant migration pathway to the Wanaque River.

## 7.0 Conclusions and Recommendations

The findings of the Wanaque River BEE indicate the co-occurrence of COPECs, ESNRs, and contaminant migration pathways to the Wanaque River. The determination of co-occurrence is based primarily on the presence of mercury, a constituent associated with former operations at the PLW site, in Wanaque River floodplain soils and river sediment at concentrations above its respective ecological screening benchmarks for these media. Although maximum concentrations of arsenic, beryllium, copper, lead, and zinc in sediment also exceeded screening levels, these metals are not considered COPECs in the Wanaque River. Arsenic and beryllium only slightly exceeded background concentrations at a single location, and the bioavailability and potential toxicity of copper, lead, and zinc are limited by ambient levels of AVS and TOC in river sediments.

The Wanaque River BEE supports the following conclusions:

- Given the frequency of detection, frequency of exceedance, and elevated concentrations, mercury is the primary COPEC in the Wanaque River adjacent to and downstream of the PLW site.
- Based on analyses of sediment in depositional areas along channel margins, mercury concentrations in Reach 1 (background) and the upper half of Reach 2 (Site Reach) were similar. However, the lower half of Reach 2 showed an increase in mercury concentrations above background.
- Concentrations of mercury in depositional areas along channel margins decreased in Reach 3 (downstream of the site) relative to the Reach 2 maximum but remain elevated above Reach 1 (background).
- Divalent metals, including copper, lead, and zinc, in depositional sediment within Reach 2 are generally co-located with elevated concentrations of mercury and are not likely bioavailable in depositional sediments based on the binding capacity of AVS and TOC.
- Phase I surface-water data indicate that concentrations of site-related metals did not exceed surface-water quality criteria; however, additional surface-water data may be useful in the evaluation of potential mercury sources and transport processes.

Based on these findings, additional investigations of potential ecological risks associated with mercury in the Wanaque River are recommended to further develop the conceptual site model for the river and to identify impacts and potential ecological risks to ESNRs. Specific recommendations for further investigations include the followings:

- Additional habitat characterization consistent with EPA Rapid Bioassessment Protocol (RBP) Visual-Based Habitat Assessment is recommended to better quantify relative differences in richest target habitats and fine-grained deposit habitats within the river.

- Additional characterization of floodplain features, including the nature and extent of riparian wetlands and eroding banks, is recommended to better understand potential zones of mercury and methylmercury transport to the river.
- Based on the findings of the Phase I investigation, additional base flow surface-water characterization is recommended to further develop the conceptual site model for potential mercury sources/transport processes. Specific objectives of additional surface-water data collection include the following:
  - Further evaluation of increases in filtered and unfiltered mercury observed in Phase I surface-water data at WR-15 and WR-20
  - Further characterization of potential source features within Reach 2, particularly in the lower half of Reach 2 where elevated concentrations of mercury were observed in sediments and adjacent floodplain/upland soils
  - Evaluation of surface water downstream of river-connected riparian wetland zones to understand potential methylmercury export from wetlands to the river
  - Further characterization of background (Reach 1) mercury and methylmercury concentrations in surface water concurrent with investigations in Reaches 2 and 3
- Additional sediment characterization is recommended to further define mercury concentrations adjacent to WR-17 and WR-18.

These recommendations were implemented as part of Phase II sediment and surface-water investigations presented in Sections 4.2 and 6.2 of the July 2011 Remedial Investigation Report.

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## Tables

**Table 1**  
**Identification of COPECs - Surface Water**  
**Baseline Ecological Evaluation**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Reach 1 Stations WR-01 to WR-08										
Analyte	Units	Dissolved(D) / Total (T)	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration	Ecological Screening Value	Ecological Screening Value Type	Ecological Screening Value Source	COPEC Decision
<b>METALS</b>										
BARIUM	UG/L	D	8	8	9.3	10.6	220	Chronic FW2 Criteria	NJDEP SWQS	N
BARIUM	UG/L	T	8	8	10.7	13.5	NA	Chronic FW2 Criteria	NJDEP SWQS	N
COPPER	UG/L	D	8	8	0.95	1.2	5.3	Chronic FW2 Criteria	NJDEP SWQS	N
COPPER	UG/L	T	8	8	1.2	3.3	5.9	Chronic FW2 Criteria	NJDEP SWQS	N
LEAD	UG/L	D	8	5	0.056	0.15	5.4	Chronic FW2 Criteria	NJDEP SWQS	N
LEAD	UG/L	T	8	8	0.25	1.5	NA	Chronic FW2 Criteria	NJDEP SWQS	N
MERCURY	UG/L	D	8	8	0.0012	0.00261	0.77	Chronic FW2 Criteria	NJDEP SWQS	N
MERCURY	UG/L	T	8	8	0.00315	0.057	NA	Chronic FW2 Criteria	NJDEP SWQS	N
<b>OTHER PARAMETERS</b>										
TOTAL HARDNESS AS CaCO <sub>3</sub>	MG/L	T	8	8	45.2	64.6	--	--	--	--
TOTAL SUSPENDED SOLIDS	MG/L	T	8	6	3.2	9.2	--	--	--	--

Reach 2 Stations WR-09 to WR-18										
Analyte	Units	Dissolved(D) / Total (T)	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration	Ecological Screening Value	Ecological Screening Value Type	Ecological Screening Value Source	COPEC Decision
<b>METALS</b>										
BARIUM	UG/L	D	10	10	10.2	11.4	220	Chronic FW2 Criteria	NJDEP SWQS	N
BARIUM	UG/L	T	10	10	10.6	13.1	NA	Chronic FW2 Criteria	NJDEP SWQS	N
COPPER	UG/L	D	10	10	0.83	1.6	5.8	Chronic FW2 Criteria	NJDEP SWQS	N
COPPER	UG/L	T	10	10	1.1	1.9	6.4	Chronic FW2 Criteria	NJDEP SWQS	N
LEAD	UG/L	D	10	6	0.061	0.13	5.4	Chronic FW2 Criteria	NJDEP SWQS	N
LEAD	UG/L	T	10	10	0.18	0.83	NA	Chronic FW2 Criteria	NJDEP SWQS	N
MERCURY	UG/L	D	10	10	0.00093	0.00382	0.77	Chronic FW2 Criteria	NJDEP SWQS	N
MERCURY	UG/L	T	10	10	0.00227	0.0395	NA	Chronic FW2 Criteria	NJDEP SWQS	N
<b>OTHER PARAMETERS</b>										
TOTAL HARDNESS AS CaCO <sub>3</sub>	MG/L	T	10	10	62.1	66.1	--	--	--	--
TOTAL SUSPENDED SOLIDS	MG/L	T	10	4	3.6	4.4	--	--	--	--

Reach 3 Stations WR-19 to WR-24										
Analyte	Units	Dissolved(D) / Total (T)	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration	Ecological Screening Value	Ecological Screening Value Type	Ecological Screening Value Source	COPEC Decision
<b>METALS</b>										
BARIUM	UG/L	D	6	6	10.4	10.9	220	Chronic FW2 Criteria	NJDEP SWQS	N
BARIUM	UG/L	T	6	6	10.9	11.4	NA	Chronic FW2 Criteria	NJDEP SWQS	N
COPPER	UG/L	D	6	6	1.1	1.7	5.6	Chronic FW2 Criteria	NJDEP SWQS	N
COPPER	UG/L	T	6	6	1.5	2.2	6.1	Chronic FW2 Criteria	NJDEP SWQS	N
LEAD	UG/L	D	6	6	0.094	0.14	5.4	Chronic FW2 Criteria	NJDEP SWQS	N
LEAD	UG/L	T	6	6	0.26	0.57	NA	Chronic FW2 Criteria	NJDEP SWQS	N
MERCURY	UG/L	D	6	6	0.00245	0.00429	0.77	Chronic FW2 Criteria	NJDEP SWQS	N
MERCURY	UG/L	T	6	6	0.0225	0.0656	NA	Chronic FW2 Criteria	NJDEP SWQS	N
<b>OTHER PARAMETERS</b>										
TOTAL HARDNESS AS CaCO <sub>3</sub>	MG/L	T	6	6	58.7	63.1	--	--	--	--
TOTAL SUSPENDED SOLIDS	MG/L	T	6	6	3.2	5.6	--	--	--	--

**Notes:**

ug/L - microgram per liter

mg/L - milligrams per liter

The ecological screening value for copper was adjusted for hardness by using an average hardness of 58.1.

NA, Criterion for constituent is based on dissolved fraction.

**Table 2**  
**Identification of COPECs - Sediment**  
**Baseline Ecological Evaluation**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Reach 1 Stations WR-01 to WR-08											
Analyte	Units	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration	Ecological Screening Value	Ecological Screening Value Type	Ecological Screening Value Source	Background Data		COPEC Decision
									UPL95	Maximum	
METALS											
ARSENIC	MG/KG	8	7	2.29	6.26	6	LEL	NJDEP Freshwater Sediment	7.581	6.26	N
BARIUM	MG/KG	8	8	61.9	128	--	NS	--	136.8	128	N
BERYLLIUM	MG/KG	8	8	0.493	0.929	--	NS	--	0.976	0.929	N
CADMIUM	MG/KG	8	8	0.718	1.35	0.6	LEL	NJDEP Freshwater Sediment	1.516	1.35	N
CHROMIUM	MG/KG	8	8	18.8	37.9	26	LEL	NJDEP Freshwater Sediment	42.22	37.9	N
COPPER	MG/KG	8	8	31.2	84.4	16	LEL	NJDEP Freshwater Sediment	96.48	84.4	N
LEAD	MG/KG	8	8	30.1	76.4	31	LEL	NJDEP Freshwater Sediment	87.16	76.4	N
MERCURY	MG/KG	8	8	0.0839	0.33	0.2	LEL	NJDEP Freshwater Sediment	0.351	0.33	N
NICKEL	MG/KG	8	8	15.5	26.7	16	LEL	NJDEP Freshwater Sediment	29.33	26.7	N
ZINC	MG/KG	8	8	112	203	120	LEL	NJDEP Freshwater Sediment	219.7	203	N
OTHER PARAMETERS											
TOTAL ORGANIC CARBON	MG/KG	8	8	16300	76300	--	--	--			--

Reach 2 Stations WR-09 to WR-18											
Analyte	Units	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration	Ecological Screening Value	Ecological Screening Value Type	Ecological Screening Value Source	Background Data		COPEC Decision
									UPL95	Maximum	
METALS											
ARSENIC	MG/KG	10	8	1.96	12.9	6	LEL	NJDEP Freshwater Sediment	7.581	6.26	Y
BARIUM	MG/KG	10	10	33.6	114	--	NS	--	136.8	128	N
BERYLLIUM	MG/KG	10	10	0.302	1.28	--	NS	--	0.976	0.929	Y
CADMIUM	MG/KG	10	7	0.423	1.34	0.6	LEL	NJDEP Freshwater Sediment	1.516	1.35	N
CHROMIUM	MG/KG	10	10	12.5	40.3	26	LEL	NJDEP Freshwater Sediment	42.22	37.9	N
COPPER	MG/KG	10	10	23.6	253	16	LEL	NJDEP Freshwater Sediment	96.48	84.4	Y
LEAD	MG/KG	10	10	22	226	31	LEL	NJDEP Freshwater Sediment	87.16	76.4	Y
MERCURY	MG/KG	10	10	0.115	57.4	0.2	LEL	NJDEP Freshwater Sediment	0.351	0.33	Y
ZINC	MG/KG	10	10	70.2	289	120	LEL	NJDEP Freshwater Sediment	219.7	203	Y
OTHER PARAMETERS											
TOTAL ORGANIC CARBON	MG/KG	10	10	9350	60200	--	--	--			--

Reach 3 Stations WR-19 to WR-24											
Analyte	Units	Number of Samples	Number of Detections	Minimum Detected Concentration	Maximum Detected Concentration	Ecological Screening Value	Ecological Screening Value Type	Ecological Screening Value Source	Background Data		COPEC Decision
									UPL95	Maximum	
BARIUM	MG/KG	6	6	18.9	69.7	--	NS	--	136.8	128	N
BERYLLIUM	MG/KG	6	5	0.201	0.697	--	NS	--	0.976	0.929	N
CADMIUM	MG/KG	6	1	0.531	0.531	0.6	LEL	NJDEP Freshwater Sediment	1.516	1.35	N
CHROMIUM	MG/KG	6	6	7.87	20.5	26	LEL	NJDEP Freshwater Sediment	42.22	37.9	N
COPPER	MG/KG	6	6	13.1	79.5	16	LEL	NJDEP Freshwater Sediment	96.48	84.4	N
LEAD	MG/KG	6	6	10.1	51.9	31	LEL	NJDEP Freshwater Sediment	87.16	76.4	N
MERCURY	MG/KG	6	6	0.943	10.3	0.2	LEL	NJDEP Freshwater Sediment	0.351	0.33	Y
ZINC	MG/KG	6	6	43.4	192	120	LEL	NJDEP Freshwater Sediment	219.7	203	N
OTHER PARAMETERS											
TOTAL ORGANIC CARBON	MG/KG	6	6	2680	55100	--	--	--			--

Notes:  
-- Not applicable  
NS - no screening value available  
LEL - lowest effect level  
mg/kg - milligram per kilogram

**Table 3**  
**Weight-of-Evidence Summary for Select Metals**  
**Baseline Ecological Evaluation**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

Analyte	Frequency of Exceedance			Maximum Concentration			Background <sup>1</sup>		Maximum SEM-AVS/ <i>f</i> <sub>oc</sub> (μmol/g <sub>oc</sub> )			Weight of Evidence Summary
	Reach 1	Reach 2	Reach 3	Reach 1	Reach 2	Reach 3	BTV - UPL95	Maximum	Reach 1	Reach 2	Reach 3	
Arsenic	0/8	1/10	0/6	6.26	12.9	ND	7.581	6.26	NA	NA	NA	Maximum concentration is comparable to background
Beryllium	0/8	3/10	0/6	0.929	1.28	0.697	0.976	0.929	NA	NA	NA	Maximum concentration is comparable to background
Copper	0/8	3/10	0/6	84.4	253	79.5	96.48	84.4	-4.77	-0.56	-16.82	Concentrations exceeded background at a limited number of stations Sufficient AVS and TOC are present to bind the metal and limit bioavailability and toxicity Elevated concentrations are generally co-located with elevated concentrations of mercury in sediment
Lead	0/8	2/10	0/6	76.4	226	51.9	87.16	76.4	-4.77	-0.56	-16.82	Concentrations exceeded background at a limited number of stations Sufficient AVS and TOC are present to bind the metal and limit bioavailability and toxicity Elevated concentrations are generally co-located with elevated concentrations of mercury in sediment
Zinc	0/8	3/10	0/6	203	289	192	219.7	203	-4.77	-0.56	-16.82	Concentrations exceeded background at a limited number of stations Sufficient AVS and TOC are present to bind the metal and limit bioavailability and toxicity Elevated concentrations are generally co-located with elevated concentrations of mercury in sediment

Notes:

ND - Not detected

NA - Not applicable

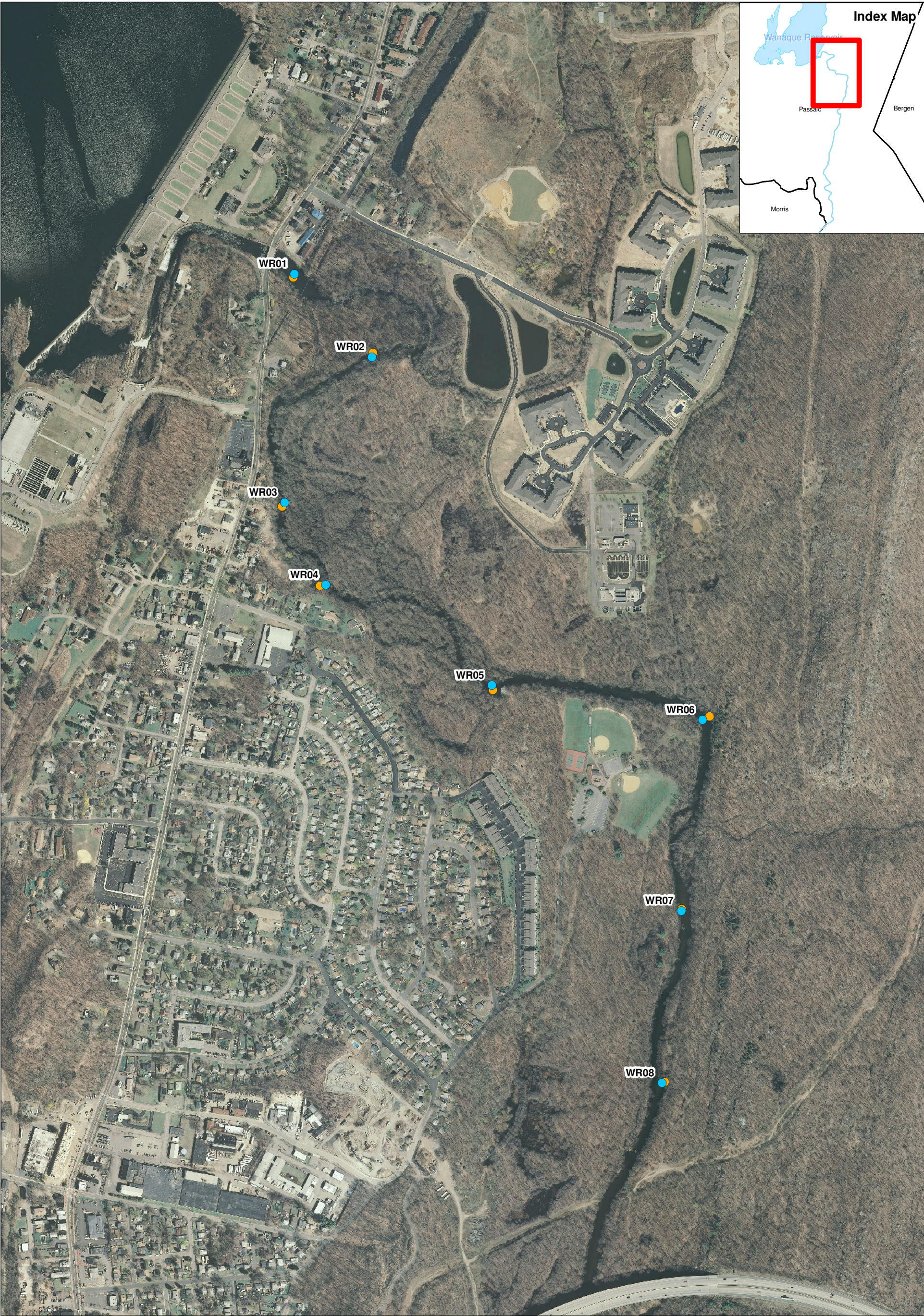
BTV - Background threshold value

1) BTV concentrations for each metal were represented as the UTL95 concentration calculated from the December 2009 sediment dataset for Reach 1.

Maximum background concentrations for each constituent are provided for comparison.

## Figures





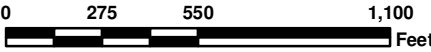
Source: Aerial Photography - NJDEP 2007

**Legend**

- Sediment Sample Location
- Surface Water Sample Location



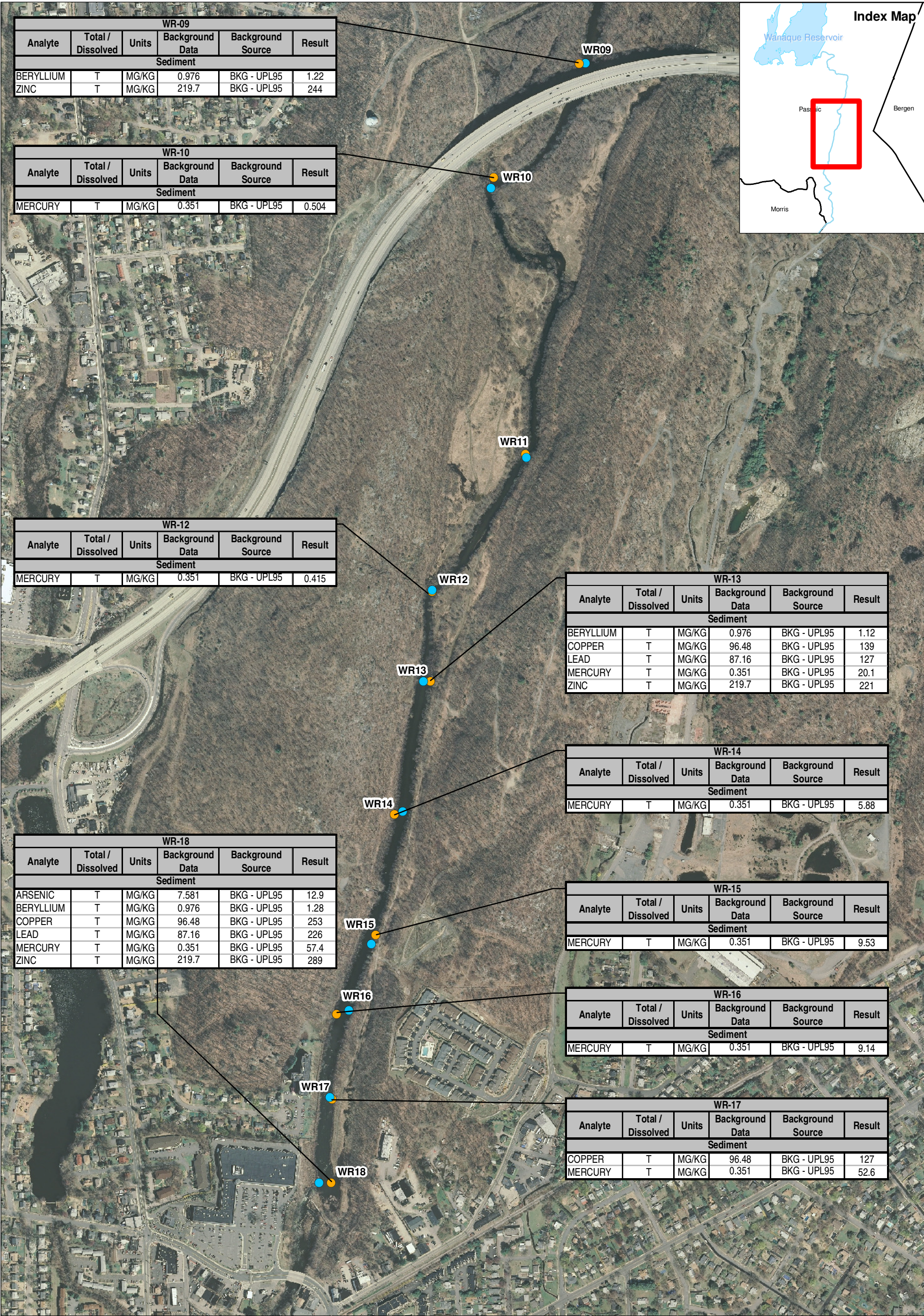
PROJECT NO. 18985748.00004



1 in = 550 ft

**Figure 1**  
**Sediment and Surface Water**  
**Sampling Locations - Reach 1**  
**Wanaque River Investigation**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**





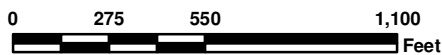
Source: Aerial Photography - NJDEP 2007

### Legend

- Sediment Sample Location
- Surface Water Sample Location



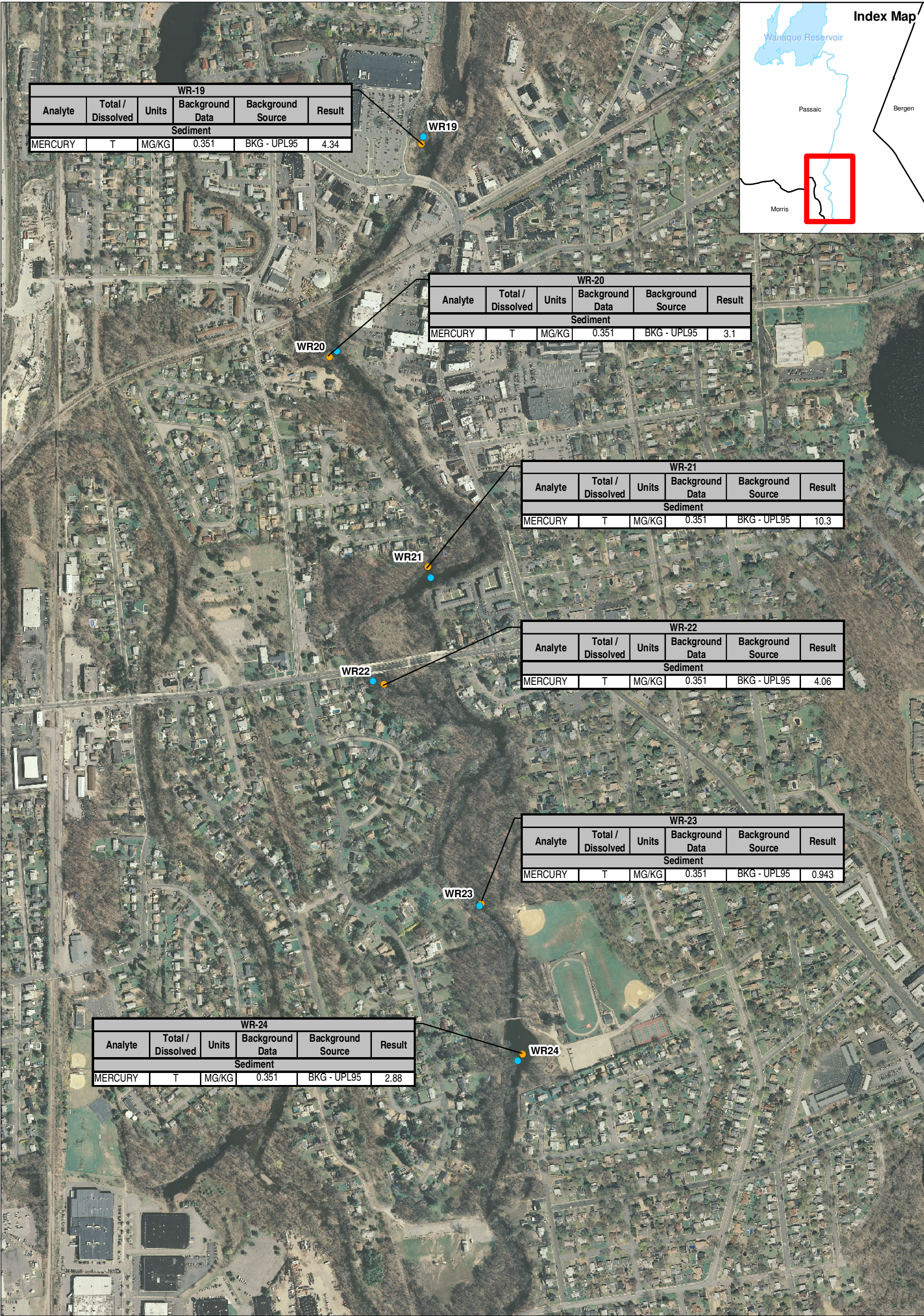
PROJECT NO. 18985748.00004



1 in = 550 ft

**Figure 2**  
**Sediment and Surface Water**  
**Sampling Locations - Reach 2**  
**Wanaque River Investigation**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

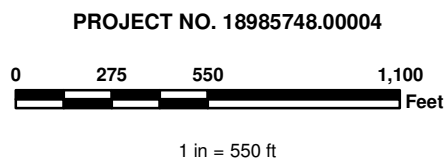




Source: Aerial Photography - NJDEP 2007

**Legend**

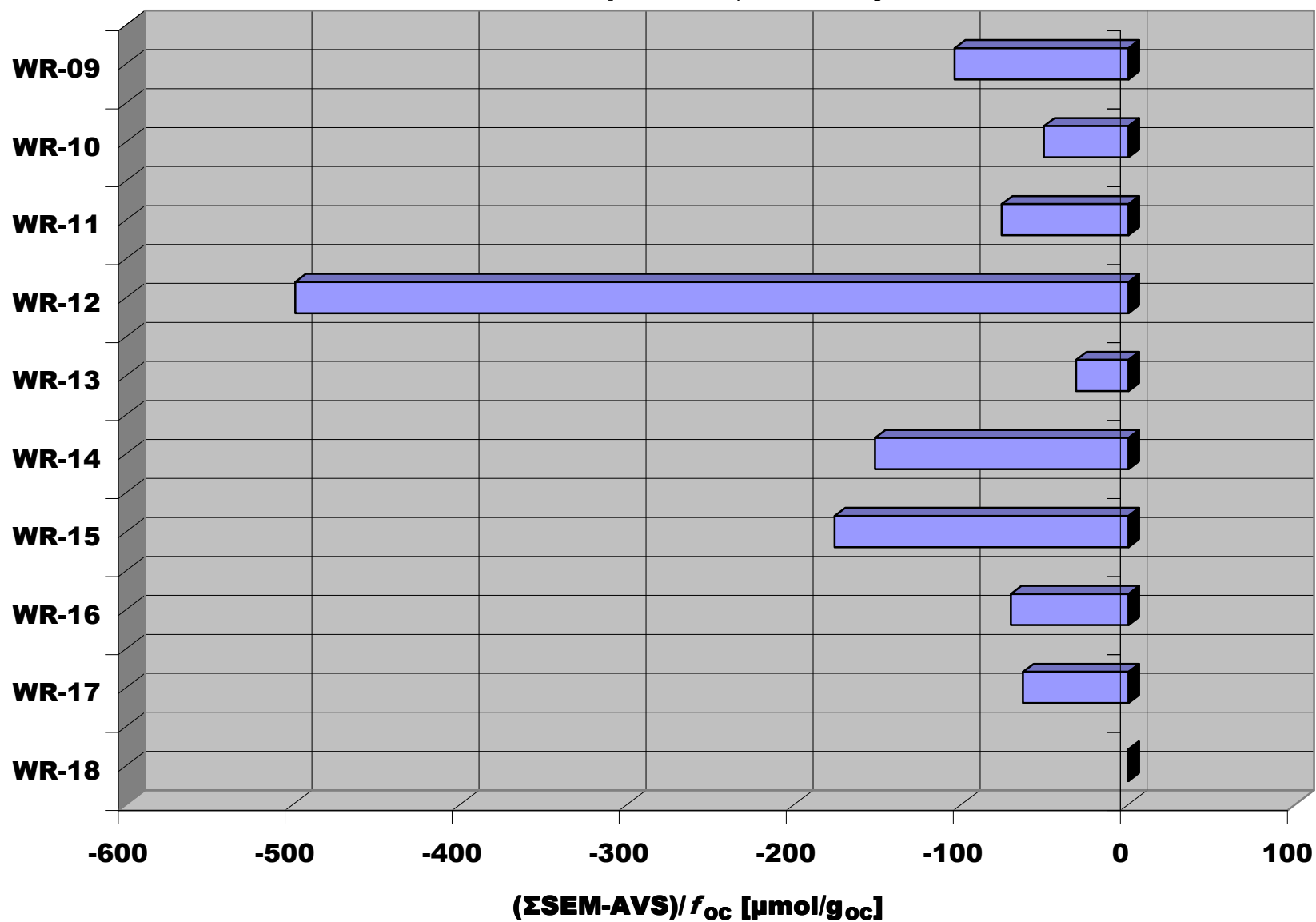
- Sediment Sample Location
- Surface Water Sample Location



**Figure 3**  
**Sediment and Surface Water**  
**Sampling Locations - Reach 3**  
**Wanaque River Investigation**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



**Figure 4. Bioavailability of Divalent Metals in Reach 2 Sediments**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



Note: Low risk of adverse biological effects when  $(\Sigma\text{SEM-AVS})/f_{oc} < 130 \mu\text{mol/g}_{oc}$

**Appendix B**

**Case Inventory Document**

## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
1	EMA	Old Cap Destruction Facility (Old Shooting Pond)	Soil	Copper, Manganese, Lead, Mercury	Soil	Direct Contact	None	<p>RA: IRM conducted in 1990 to prevent the migration of contaminants to AOC 5. The IRM included the removal of impacted materials, milling of the material to detonate any live blasting caps, off-site disposal of the material, the creation of a retention basin and the implementation of erosion control measures. Interim Measure Completed and Approved by NJDEP January 30, 1992. Additional delineation of the buffer area surrounding the IRM was undertaken starting in 2001.</p> <p>RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation performed and completed in 2003-2007. Phase 3 remedial investigation performed and completed in 2008. Additional delineation sampling implemented 4th quarter of 2009. Lead and Mercury were detected in excess of the NR SRS. Copper, Lead, Manganese and Mercury were detected in excess of the IGW SRS. Onsite Delineation to NR SRS complete. Delineation to RDC SRS at the property</p>
2	EMA	Upper Burning Ground	Soil	Lead, Mercury	Soil	Direct Contact	None	<p>RA: IRM conducted on area to remove cage and erosion control fencing installed in two places along the down-gradient slope, approximately 30 feet and 70 to 90 feet from the former burning cage. Resource Conservation and Recovery Act (RCRA) Closure Pending.</p> <p>RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008. Lead was detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>
3	EMA	Old Lead Recycling Area	Soil	Lead, Mercury	Soil	Direct Contact	None	<p>RA: An interim stabilization measure (ISM) was conducted in October 1996. Visible pieces of lead tubing were covered and the area seeded. Silt fencing was installed to help control erosion from the area.</p> <p>RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008. Lead was detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>
4	EMA	Sludge Pile and Burning Pit	Soil	Lead, Mercury	Soil	Direct Contact	None	<p>RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead and Mercury was detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>
5	EMA	Shooting Pond	Soil	Copper, Lead, Mercury, Selenium	Soil	None	None	<p>RA: Remediation/closure activities occurred from the latter part of 1990 into early 1991. Remediation activities entailed the excavation of the dredged materials from Acid Brook just up- and down-stream of AOC5/6, milling of the excavated material to detonate any live blasting caps, and off-site disposal of the material. Confirmation sampling results were presented in the report entitled, Shooting Pond Confirmation Soil Sampling Results, D&amp;M, February 1991. The wetland restoration took place in mid-1991, and the shooting pond received RCRA final closure from the NJDEP in their letter dated August 8, 1991. The document, "Operational History", was submitted to NJDEP in February 1989. RCRA Final Closure Approved August 8, 1991 by NJDEP.</p>
6	EMA	Shooting Pond Sludge Pile	Soil	Copper, Lead, Mercury, Selenium	Soil	None	None	<p>RA: Remediation/closure activities occurred from the latter part of 1990 into early 1991. Remediation activities entailed the excavation of the dredged materials from Acid Brook just up- and down-stream of AOC5/6, milling of the excavated material to detonate any live blasting caps, and off-site disposal of the material. Confirmation sampling results were presented in the report entitled, Shooting Pond Confirmation Soil Sampling Results, D&amp;M, February 1991. The wetland restoration took place in mid-1991, and the shooting pond received RCRA final closure from the NJDEP in their letter dated August 8, 1991. The document, "Operational History", was submitted to NJDEP in February 1989. RCRA Final Closure Approved August 8, 1991 by NJDEP.</p>
7	EMA	Zirconium Disposal Area	Soil	Lead, Mercury	Soil	None	None	<p>RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. No compounds were detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>
8	EMA	Mercury Fulminate/Lead Azide Storage Tank A	Soil	Lead, Mercury	Soil	None	None	<p>RI: Phase 1 Remedial Investigation completed in 2002. No compounds were detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>

## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
9	EMA	Mercury Fulminate/Lead Azide Storage Tank B	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling conducted in the 4th quarter of 2009 and the 1st quarter of 2010. Mercury was detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
10	EMA	Mercury Fulminate/Lead Azide Storage Tank C	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Lead was detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
11	EMA	Buried Rags	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead was detected in excess of the NR SRS. Lead and Mercury was detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
12	EMA	Mercury Fulminate Platform	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Mercury was detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
13	EMA	Powder Dry House Impoundment	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Mercury was detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
14	EMA	50/25/25 Drain Filter Tank	Soil	Arsenic, Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Arsenic was detected in excess of the NR SRS. Lead and Mercury were detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
15	EMA	Figure 8 Sludge Bowl Dump	Soil	Antimony, Beryllium, Cadmium, Lead, Mercury, Zinc	Soil	Direct Contact	None	RI: Investigation began during Phase 3. Delineation sampling completed in 2008 / 2009. Lead was detected in excess of the NR SRS. Antimony, Beryllium, Cadmium, Lead, Mercury and Zinc were detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
16	EMA	Mop Station No.1	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. No compounds were detected in excess of the NR SRS. Lead and Mercury were detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
17	EMA	Mop Station No. 2	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. No compounds were detected in excess of the NR SRS. Lead and Mercury were detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
18	EMA	Lead Azide Ponds (3) (also AOC 19)	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead detected in excess of NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
19	EMA	Lead Azide Tanks (3) (also AOC 18)	Soil	Lead, Mercury.	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation report scheduled for 2010. Lead detected in excess of NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
20	EMA	Mop Station No. 3	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. No exceedances of NR SRS. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010..
21	EMA	RDX/PETN Impoundment	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Lead exceeds NR SRS. Lead delineation complete within the boring. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.

## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
22	EMA	Lead Salt Lagoons	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead was detected in exceedance of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
23	EMA	Sodium Azide Pit	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
24	EMA	Sodium Azide Rinse Water	Soil	Beryllium, Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead detected in excess of NR SRS. Beryllium, lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
25	EMA	Lead Nitrate Waste Water	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Lead detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial Investigation report submitted June 2010.
26	EMA	Mercury Fulminate/Lead Azide Storage Tank D	Soil	Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Mercury detected in excess of NR and IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
27	EMA	Mercury Fulminate Platform	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of NR SRS. Lead and Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
28	EMA	Lead Styphnate Pit	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
29	EMA	Lead Styphnate Deactivation Shed 1	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Mercury detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Phase 3 delineation sampling completed in 2008 / 2009 conducted in concert with AOC 30. Remedial investigation completed. Remedial Investigation report submitted June 2010.
30	EMA	Lead Styphnate Deactivation Runoff Area	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009 conducted in concert with AOC 29. Lead and mercury detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
31	EMA	Mercury Fulminate/Lead Azide Storage Tank E	Soil	Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury present in excess of NR and IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
32	EMA	Mop Station No. 4	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No compounds detected in excess of NR SRS. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
33	EMA	Triple Filter Collection Tank	Soil	None	None	None	None	No further action is required by NJDEP for AOC 33, Triple Filter Collection Tank, as stated in their letter dated December 12, 1989.
34	EMA	Mop Station No 5	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Delineated to NRDC SCC within the boring. Mercury detected in excess of NR and IGW SRS. Lead detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.

## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
35	EMA	Mop Station No.6	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Delineated to NRDC SCC within the boring. Lead and mercury detected in excess of NR and IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
36	EMA	Powder Transfer Sump(s)	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
37	EMA	Laboratory Sump	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
38	EMA	Mop Station No. 7	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
39	EMA	North Biazzi Dryer Baffle Box	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
40	EMA	Biazzi Alcohol/Water Sump	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
41	EMA	South Biazzi Dryer Baffle Box	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
42	EMA	Barium Peroxide/Selenium Mix House	Soil	Lead, Mercury, Selenium	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Lead, mercury and selenium detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
43	EMA	Mop Station No. 8	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Delineation completed within boring. Lead and mercury detected in excess of NR and IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
44	EMA	Mop Station No. 9	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
45	EMA	Mop Station No. 10	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Lead and mercury detected in excess of NR and IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
46	EMA	Mop Station No. 11	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
47	EMA	Black Powder Mill	Soil	PAHs, Beryllium, Cadmium, Lead, Mercury, Zinc	Soil	Direct Contact	None	RA: Interim Measure Completed in 1991.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation performed and completed in 2003-2007. Phase 3 remedial investigation performed and completed in 2008. Additional delineation sampling conducted in the 4th quarter of 2009. PAHs, beryllium, cadmium, lead, mercury and zinc in excess of IGW SRS. Lead, mercury and PAHs in excess of NR SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
48	EMA	Delay Tube Manufacturing	Soil	PAHs, Beryllium, Cadmium, Lead, Mercury, Zinc	Soil	Direct Contact	None	RA: Interim Measure Completed in 1991.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation performed and completed in 2003-2007. Phase 3 remedial investigation performed and completed in 2008. Additional delineation sampling conducted in the 4th quarter of 2009. PAHs, beryllium, cadmium, lead, mercury and zinc in excess of IGW SRS. Lead, mercury and PAHs in excess of NR SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
49	EMA	Mop Station No 12	Soil	Beryllium, Lead, Mercury, Selenium	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Beryllium, lead, mercury and selenium detected in excess of IGW SRS. No detection in excess of NR SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.

## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
50	EMA	Sawdust Rumbler	Soil	PAHs, Beryllium, Lead, Mercury, Selenium, Zinc	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on changes in the June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Benzo(a)Anthracene, Benzo(b)Flouranthene, Benzo(a)Pyrene, Dibenz(a,h)Anthracene, Lead, Mercury detected in excess of NR SRS. Benzo(a)Anthracene, Benzo(b)Flouranthene, Benzo(a)Pyrene, Dibenz(a,h)Anthracene, Indeno,(1,2,3-cd)Pyrene, Beryllium, Lead, Mercury, Selenium, Zinc detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
51	EMA	Mop Station No. 13 (within AOC 164)	Soil	Benzo(a)pyrene, Barium, Beryllium, Cadmium, Lead, Mercury, Selenium, Zinc	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Benzo(a)pyrene, Lead, and Mercury detected in excess of the NR SRS. Barium, Benzo(a)pyrene, Beryllium, Cadmium, Lead, Mercury, Selenium and Zinc detected in excess of the IGW SRS. AOC 51 is located within AOC 140 and is delineated in concert with AOC 140. Remedial investigation completed. Remedial Investigation report submitted June 2010.
52	EMA	Mercury Fulminate Storage Building	Soil	Mercury	Soil	None	None	RA: Interim Measures Completed February 1997 for entire length of Brook including AOC 52. The remediation of Acid Brook took place in six phases. The investigation and remediation activities performed in AOC 118 are summarized in the On-Site Acid Brook Project Remedial Action Report, dated March 26, 1999, in which DuPont requested a no further action letter from NJDEP for AOC 118. Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Interim Measure Completed as Part of AOC 118 Interim Measure in 1996.  RI: DuPont revisited the mercury exceedance of the NR SRS in boring 52-2 Phase 3 delineation sampling completed in 2008. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
53	EMA	Mop Station No. 14	Soil	Beryllium, Lead, Mercury, Selenium	Soil	None	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead and mercury exceed NR SRS. Delineation completed within the boring. Beryllium, lead, mercury and selenium in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
54	EMA	Mop Station No. 15 (within AOC 165)	Soil	Beryllium, Lead, Mercury, Selenium	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead and mercury exceed NR SRS. Beryllium, lead, mercury and selenium in excess of IGW SRS. Remedial investigation report scheduled for 2010. Because AOC 54 and AOC 142 are mop stations located within former building FA-206 (AOC 165), the lead and mercury exceedances will be delineated within the larger AOC 165. Remedial investigation completed. Remedial Investigation report submitted June 2010.
55	EMA	Cap Pressing Area	Soil	Lead, Mercury, Selenium	Soil	None	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. DuPont revisited the mercury exceedance of the NR SRS in boring 55-3. Phase 3 delineation sampling completed in 2008. Lead, Mercury and Selenium detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
56	EMA	Sawdust Pile	Soil	Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	Soil	Direct Contact	None	RA: Interim Measure Completed and Approved by NJDEP on December 8, 1992.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation performed and completed in 2003-2007. Phase 3 remedial investigation performed and completed in 2008. Further investigation necessary based on results of previous sampling events. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Methyl Chloride, Nickel, Selenium, Zinc in excess of NR SRS. Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Methyl Chloride, Nickel, Selenium, Tetrachloroethylene, Trichloroethylene, Zinc in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
57	EMA	Old Cap Test Area	Soil	Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	Soil	Direct Contact	None	RA: Interim Measure Completed and Approved by NJDEP on December 8, 1992.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Methyl Chloride, Nickel, Selenium, Zinc in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.



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						Existing	Potential	
58	EMA	Burned Wire Dump	Soil	Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	Soil	Direct Contact	None	RA: Interim Measure Completed and Approved by NJDEP on December 8, 1992.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Methyl Chloride, Nickel, Selenium, Zinc in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
59	EMA	Cap Test Well	Soil	Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	Soil	Direct Contact	None	RA: DuPont requests a no further action letter from NJDEP for this AOC because this well and its surrounding area has been remediated to bedrock, no further action is necessary. Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation performed and completed in 2003-2007. Phase 3 remedial investigation performed and completed in 2008. Further investigation necessary based on results of previous sampling events. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Methyl Chloride, Nickel, Selenium, Zinc in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
60	EMA	Lower Burning Ground	Soil	Antimony, Barium, Beryllium, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	Soil	Direct Contact	None	RA: RCRA Interim Closure approved in 1994. DuPont covered this AOC as part of an IRM.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Methyl Chloride, Nickel, Selenium, Zinc in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
61	EMA	Lead Recycling Area	Soil	Antimony, Barium, Beryllium, Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	Soil	Direct Contact	None	RA: RCRA Interim Closure approved in 1994. DuPont covered this AOC as part of an IRM.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Antimony, Barium, Benzene, Beryllium, Cadmium, Copper, Lead, Mercury, Methyl Chloride, Nickel, Selenium, Tetrachloroethylene, Trichloroethylene, Zinc in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
62	EMA	Mop Station No. 16	Soil	None	None	None	None	RI: Remedial investigation completed. Discussed in 2002 RIWP. No analytes were detected above the NJ-NRDC-SCC or the NJ-IGW-SCC.
63	EMA	Boron/Red Lead Waste Water Tank 1	Soil	Benzene, PAHs, Aluminum, Beryllium, Cadmium, Lead, Magnesium, Mercury, Selenium, Thallium, Zinc	Soil	Direct Contact	Groundwater	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Lead and Mercury were detected in excess of the NR SRS. Cis-1,2 Dichloroethene, Tetrachloroethylene, Trichloroethene, Vinyl Chloride, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Naphthalene, Aluminum, Beryllium, Cadmium, Lead, Magnesium, Mercury, Selenium, Thallium and Zinc was detected in excess of the IGW SRS. AOC 63 was replaced by AOC 64 and are therefore discussed in concert. Remedial investigation completed. Remedial Investigation report submitted June 2010.
64	EMA	Boron/Red Lead Waste Water Tank 2	Soil	PAHs, Aluminum, Beryllium, Cadmium, Lead, Magnesium, Mercury, Selenium, Thallium, Zinc	Soil	Direct Contact	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Lead and Mercury were detected in excess of the NR SRS. Cis-1,2 Dichloroethene, Tetrachloroethylene, Trichloroethene, Vinyl Chloride, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Naphthalene, Aluminum, Beryllium, Cadmium, Lead, Magnesium, Mercury, Selenium, Thallium and Zinc was detected in excess of the IGW SRS. AOC 63 was replaced by AOC 64 and are therefore discussed in concert. Remedial investigation completed. Remedial Investigation report submitted June 2010.
65	EMA	Delay Loader Impoundment	Soil	Beryllium, Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Lead detected in excess of the NR SRS. Delineation is completed within the boring. Beryllium, Lead, Mercury and Tetrachloroethylene in excess of the IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.

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66	EMA	Boron/Red Lead Sand Filter	Soil	PAHs, Beryllium, Lead, Mercury, Selenium	Soil	Direct Contact	None	RI: Phase 3 delineation sampling completed in 2008 / 2009. Tetrachloroethylene, Benzo(a)pyrene, Dibenz(a,h)anthracene and Lead in excess of the NR SRS. 1,1,1-Trichloroethane, 1,1-Dichloroethane, Tetrachloroethylene, Trichloroethene, Benzo(a)anthracene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Beryllium, Lead, Mercury and Selenium were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
67	EMA	Test Well No. 1	Soil	Antimony, Beryllium, Cadmium, Copper, Lead, Mercury, Selenium and Zinc	Soil	Direct Contact	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead was detected in excess of the NR SRS. Antimony, Beryllium, Cadmium, Copper, Lead, Mercury, Selenium and Zinc were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
68	EMA	Lead Styphnate Deactivation Shed 2	Soil	Beryllium, Lead, Mercury	Soil	None	None	RI: Phase 3 delineation sampling completed in 2008 / 2009. No compounds were detected in excess of the NR SRS. 1,1,1-Trichloroethane, 1,1-Dichloroethane, Tetrachloroethylene, Trichloroethene, Beryllium, Lead and Mercury was detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
69	EMA	Gasoline UST No.1	Soil	Tetrachloroethylene, PAHs, Aluminum, Beryllium, Lead, Manganese, Mercury, Silver, Thallium, Zinc	Soil	Direct Contact	Groundwater	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Tetrachloroethylene, Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene and Indeno(1,2,3-CD) Pyrene were detected in excess of the NR SRS. Tetrachloroethylene, Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene, Chrysene, Indeno(1,2,3-CD) Pyrene, Aluminum, Beryllium, Lead, Manganese, Mercury, Silver, Thallium and Zinc were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
70	EMA	Experimental Lead Azide Laboratory	Soil	PAHs, Beryllium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Zinc	Soil	Direct Contact	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Copper and Lead were detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Beryllium, Copper, Lead, Mercury, Nickel, Selenium, Silver and Zinc were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
71	EMA	Mop Station No. 17	Soil	Mercury, Nickel	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. No compounds were detected in excess of the NR SRS. Mercury, Methylene Chloride and Nickel were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
72	EMA	Powder Sump	Soil	Benzo(a)pyrene, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Zinc	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Tetrachloroethylene, Trichloroethene, Benzo(a)pyrene and Lead were detected in excess of the NR SRS. Cist 1,2-dichloroethene, Methyl Ethyl Ketene, Tetrachloroethylene, Trichloroethene, Vinyl Chloride, Benzo(a)pyrene, Nitrosodiphenylamine, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver and Zinc were detected in excess of the IGW SRS. Delineated in combination with AOCs 143 and 144. Remedial investigation completed. Remedial Investigation report submitted June 2010.
73	EMA	Assembly Machine Solvent Sump	Soil	Tetrachloroethene, Beryllium, Lead, Mercury	Soil	None	Groundwater	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Phase 1 Remedial Investigation completed in 2002. No VOCs were detected in excess of NJ SRS in AOC 73 the former Assembly Machine Solvent Sump. Beryllium, Lead and Mercury detected in exceedance of IGW SRS. Mercury detected in exceedance of NR SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.



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74	EMA	Mercury Fulminate Plant	Soil	Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium, Zinc	Soil	Direct Contact	None	RA: IRM completed April 29, 1991. Excavation activities were conducted from May 1992 through June 1992, and are reported in the DuPont Mercury Fulminate Area (SWMUs 74, 75, and 76) Interim Remedial Action Report, dated August 1992. The IRM consisted of removing 4,632 cubic yards of soils and collecting post-excavation samples. 5 cubic yards of soil removed from hillside in 1992.  RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene, Dibenz(a,h)anthracene, Lead and Mercury were detected in excess of NR SRS. Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium and Zinc were detected in excess of the IGW SRS. Delineated in combination with AOC 75, 76 and 77. Remedial investigation completed. Remedial Investigation report submitted June 2010.
75	EMA	Mercury Fulminate Fume Line No.1 (within AOC 74)	Soil	Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium, Zinc	Soil	Direct Contact	None	RA: IRM completed April 29, 1991. Excavation activities were conducted from May 1992 through June 1992, and are reported in the DuPont Mercury Fulminate Area (SWMUs 74, 75, and 76) Interim Remedial Action Report, dated August 1992. The IRM consisted of removing 4,632 cubic yards of soils and collecting post-excavation samples. 5 cubic yards of soil removed from hillside in 1992.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene, Dibenz(a,h)anthracene, Lead and Mercury were detected in excess of NR SRS. Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium and Zinc were detected in excess of the IGW SRS. Delineated in combination with AOC 74, 76 and 77. Remedial investigation completed. Remedial Investigation report submitted June 2010.
76	EMA	Mercury Fulminate Fume Line No.2 (within AOC 74)	Soil	Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium, Zinc	Soil	Direct Contact	None	RA: IRM completed April 29, 1991. Excavation activities were conducted from May 1992 through June 1992, and are reported in the DuPont Mercury Fulminate Area (SWMUs 74, 75, and 76) Interim Remedial Action Report, dated August 1992. The IRM consisted of removing 4,632 cubic yards of soils and collecting post-excavation samples. 5 cubic yards of soil removed from hillside in 1992.  RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene, Dibenz(a,h)anthracene, Lead and Mercury were detected in excess of NR SRS. Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium and Zinc were detected in excess of the IGW SRS. Delineated in combination with AOC 74, 75 and 77. Remedial investigation completed. Remedial Investigation report submitted June 2010.
77	EMA	Scrap Metal Area	Soil	Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium, Zinc	Soil	Direct Contact	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene, Dibenz(a,h)anthracene, Lead and Mercury were detected in excess of NR SRS. Benzo(a)pyrene, Dibenz(a,h)anthracene, Aluminum, Barium, Beryllium, Lead, Manganese, Mercury, Selenium and Zinc were detected in excess of the IGW SRS. Delineated in combination with AOC 74, 75 and 76. Remedial investigation completed. Remedial investigation report submitted June 2010.
78	EMA	Former Fuel Oil Tank	Soil	PAHs, Aluminum, Arsenic, Beryllium, Lead, Manganese, Mercury, Nickel, Silver, Vanadium	Soil	Direct Contact	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD), Mercury and Vanadium were detected in excess of the NR SRS. Tetrachloroethylene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Aluminum, Arsenic, Beryllium, Lead, Manganese, Mercury, Nickel and Silver were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.

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79	EMA	Machine Shop Solvent Sump 1	Soil	Chlorinated VOCs, Aluminum, Antimony, Beryllium, Cadmium, Cobalt, Lead, Manganese, Mercury, Nickel, Vanadium, Zinc	Soil	Direct Contact	Groundwater	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Carbon Tetrachloride, Chloroform, Tetrachloroethylene, Trichloroethene and Vanadium were detected in excess of the NR SRS. 1,1-Dichloroethene, Acetone, Benzene, Carbon Tetrachloride, Chloroform, Cist 1,2-dichloroethene, Methyl Ethyl Ketene, Methylene Chloride, Tetrachloroethylene, Toluene, Trichloroethene, Vinyl Chloride, Xylenes, Diethyl Phthalate, Aluminum, Antimony, Beryllium, Cadmium, Cobalt, Lead, Manganese, Mercury, Nickel, Vanadium and Zinc were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
80	EMA	Shell Plant Reverse Osmosis System	Soil	None	None	None	None	RI: Remedial investigation completed. NJDEP issued a No Further Action for this AOC in their letter, dated December 12, 1989.
81	EMA	Machine Shop Solvent Shed	Soil	Aluminum, Beryllium, Cadmium, Lead, Manganese, Mercury	Soil	Direct Contact	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead and Mercury were detected in excess of NR SRS. Carbon Tetrachloride, Tetrachloroethylene, Trichloroethene, Aluminum, Beryllium, Cadmium, Lead, Manganese and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
82	EMA	Mercury Fulminate Transfer Platform	Soil	PAHs, Aluminum, Arsenic, Beryllium, Cadmium, Lead, Manganese, Mercury, Silver	Soil	Direct Contact	None	RI: Exploratory Sampling Data Submitted to NJDEP on April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Aluminum and Arsenic were detected in excess of NR SRS. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Aluminum, Arsenic, Beryllium, Cadmium, Lead, Manganese, Mercury and Silver were detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
83	EMA	Old Electric Shop	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
84	EMA	Control Lab Chemical Sink Pit	Soil	Lead, Mercury, PCBs	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
85	EMA	Control Lab Chemical Sink Tank	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
86	EMA	Pickling Acid Tanks	Soil	PAHs	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
87	EMA	Lagoon No. 1	Soil	PAHs, Lead, Mercury, PCBs	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP May 30, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
88	EMA	Machine Shop Scrap Dump	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
89	EMA	Acid Crock	Soil	None	None	None	None	RI: Data submitted to NJDEP Oct 2002. Exploratory Sampling Data submitted to NJDEP May 30, 1991. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted June 2010.



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90	EMA	Old Paint Shop	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
91	EMA	Lagoon No. 2	Soil	PAHs	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
92	EMA	Hand Line Solvent Dump	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
93	EMA	Old Boron/Red Lead Process Area	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
94	EMA	Test Well No. 2	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
95	EMA	Lagoon No. 4	Soil	PAHs, PCBs	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
96	EMA	Test Well No. 3	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
97	EMA	Lagoon No. 3	Soil	PAHS, Lead, Mercury, PCBs	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
98	EMA	Old Hand Line Area	Soil	None	None	None	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Characterization Sampling Data Submitted to NJDEP. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
99	EMA	Fuze Works	Soil	PAHs	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
100	EMA	Old Detonator Assembly Area	Soil	PAHs, Lead	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
101	EMA	Salvage Yard	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.
102	EMA	Rivet Line Lagoon	Soil	Lead, Mercury	Soil	Direct Contact	None	RA: RAR submitted July 2003. In 2000, DuPont excavated and removed all of the soil and debris in this area down to bedrock and collected post-excavation perimeter samples. All investigation data and proposed remedial action for AOCs 102, 104 and 105 are presented in the Remedial Action Work plan AOCs 102, 104, 105 and Tributaries, DuPont, Pompton Lakes: Block 100 Lot7, dated May 25, 2000. Report Submitted to NJDEP 2002.  RI: Remedial Investigation completed in 2001.
103	EMA	General Dump	Soil	PAHs, Lead	Soil	Direct Contact	None	RI: Exploratory Sampling Data submitted to NJDEP April 12, 1991. Remedial Investigation completed in 2001. Remedial Investigation report submitted to NJDEP Oct 2002.

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AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
104	EMA	Canister Disposal	Soil	PAHS, Lead, Mercury	Soil	None	None	<p>RA: RAR submitted July 2003. In 2000, DuPont excavated and removed all of the soil and debris in this area down to bedrock and collected post-excavation perimeter samples. All investigation data and proposed remedial action for AOCs 102, 104 and 105 are presented in the Remedial Action Work plan AOCs 102, 104, 105 and Tributaries, DuPont, Pompton Lakes: Block 100 Lot7, dated May 25, 2000.</p> <p>RI: Remedial Investigation completed in 2001. Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene and Indeno(1,2,3-CD) were detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD), Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>
105	EMA	Scrap Metal Dump	Soil	PAHS, Lead, Mercury	Soil	None	None	<p>RA: RAR submitted July 2003. In 2000, DuPont excavated and removed all of the soil and debris in this area down to bedrock and collected post-excavation perimeter samples. All investigation data and proposed remedial action for AOCs 102, 104 and 105 are presented in the Remedial Action Work plan AOCs 102, 104, 105 and Tributaries, DuPont, Pompton Lakes: Block 100 Lot7, dated May 25, 2000.</p> <p>RI: Remedial Investigation completed in 2001. Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene and Indeno(1,2,3-CD) were detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(b)flouranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD), Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>
106	EMA	Sewage Treatment	None	None	None	None	None	RA: No further action submitted in 2003. Soil removed from area to depth of 42" in area.
107	WMA	Main Office Shooting Ground	Soil	Arsenic, Lead, Mercury	Soil	Direct Contact	Surface Water, Ground water	<p>RA: Interim Remedial Measure (IRM) 2001. Remedial action report submitted April 2004.</p> <p>RI: Additional delineation required outside IRM area for RDCSCC. "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003. Additional delineation sampling implemented during Phase 3 in 2008 / 2009. Remedial investigation completed. Remedial Investigation report submitted June 2010.</p>
108	WMA	Old Cladding Tunnel	Soil	Copper	Soil	None	None	RI: "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial Investigation report submitted December 2010.
109	WMA	Old Fuze Works	Soil	PAHS, Arsenic, Lead, Mercury	Soil	Direct Contact	Surface Water, Groundwater	RI: Geophysical Investigation of the Lake Inez Fuze Works, June 8, 1993. "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. "Lake Inez Valley Preliminary Assessment Report", April 1996. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.
110	WMA	Barrel Dump Area	Soil	Lead	Soil	None	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial Investigation report submitted December 2010.
111	WMA	Tunnel Residue Dump	Soil	PAHs, Mercury, Lead	Soil	Direct Contact	None	<p>RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter.</p> <p>RI: Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Remedial investigation completed. Remedial Investigation report submitted December 2010.</p>
112	WMA	Lakefront Magazine	Soil	None	None	None	None	RI: "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial Investigation report submitted December 2010.



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						Existing	Potential	
113	WMA	Lake Inez	Soil	PAHs, Arsenic, Lead, Mercury	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Remedial investigation completed. Remedial Investigation report submitted December 2010.
114	WMA	Upper Dump	Soil	PAHs, Lead, Copper, Mercury, Nickel, Antimony, Selenium	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Remedial investigation completed. Remedial Investigation report submitted December 2010.
115	WMA	Lead Carbonate Sludge Pile	Soil	PAHs, Lead	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Remedial investigation completed. Remedial Investigation report submitted December 2010.
116	EMA	Sanitary Sewer Sludge Pile	Soil	PAHs, Beryllium, Cadmium, Copper, Lead, Mercury, Selenium, Zinc	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene, Dibenzo(a,h)anthracene, Lead, and Mercury were detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(a)pyrene, Beryllium, Cadmium, Copper, Dibenzo(a,h)anthracene, Lead, Mercury, Selenium, Zinc were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
117	NMA	Ballistite Operation	Soil	Benzo(a)pyrene, Arsenic, Beryllium, Lead, Mercury	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events and a change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Benzo(a)pyrene, Arsenic and Lead were detected in excess of the RDC SRS. Benzo(a)pyrene, Arsenic, Beryllium, Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
118	ABV	Acid Brook	None	None	None	None	None	RA: Interim Measures Completed February 1997 for entire length of Brook. The remediation of Acid Brook took place in six phases. The investigation and remediation activities performed in AOC 118 are summarized in the On-Site Acid Brook Project Remedial Action Report, dated March 26, 1999, in which DuPont requested a no further action letter from NJDEP for AOC 118. Offsite - No Further Action (NFA) granted.
118A	ABV Offsite	Acid Brook Delta and Delta Uplands	Soil, Sediment	Mercury, Lead, Copper, Selenium	Soil, Sediment	Direct Contact	None	RI Uplands: Remedial investigation completed in 2009-2010. Mercury and lead were detected above RDC SRS and copper, lead, mercury and selenium were detected above the minimum of ecological and RDC SRS. Delineations complete and remedial investigation report scheduled for June 2010. RI Delta: Sediment and surface water data were presented in the "Draft Remedial Action Proposal" (DuPont CRG, 2006) and the "Revised Acid Brook Delta Remedial Investigation Report" (DuPont CRG, 2008). NJDEP, in its letter of May 2008, confirmed that mercury delineation in Pompton Lake was complete. Subsequently, NJDEP, in its letter of June 19, 2008, approved, without conditions, the Revised Acid Brook Delta Remedial Investigation Report (RIR) dated January 30, 2008. RA Delta and Uplands: A portion of the uplands was remediated as documented in the "Phase I of the Acid Brook Delta Project Remedial Action Report" (DERS, 1997), submitted to the NJDEP in January 1997. The remedial approach for the delta was determined based on the evaluations contained in the Acid Brook Delta Area Remedial Action Selection Report/Corrective Measures Study (RASR/CMS; DuPont CRG, September 2009) and was subsequently approved by the NJDEP and USEPA on October 22, 2009. Per the approved RASR/CMS, the selected remedial approach for the site is removal (Alternative 4). A CMI WP for the delta and uplands was submitted June 2010. A revised CMI WP based on the 2010 investigation activities, responses to NJDEP comments, and input received from

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119	NMA	North West Lake Inez	Soil	Benzo(a)pyrene, Arsenic, Beryllium, Lead, Mercury	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter.  RI: Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Arsenic, Benzo(a)pyrene, and Lead were detected in excess of the RDC SRS. Arsenic, Beryllium, Lead, Mercury, Benzo(a)pyrene were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
119 (SOUTH)	WMA	North West Lake Inez	Soil	Benzo(a)pyrene, Arsenic, Lead, Mercury	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter.  RI: Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Arsenic and Benzo(a)pyrene were detected in excess of the RDC SRS. Arsenic, Beryllium, Lead, Mercury, Benzo(a)pyrene were detected in excess of the IGW SRS. Remedial investigation completed. Remedial investigation report submitted December 2010.
120	EMA	Gasoline UST No. 2	None	None	None	None	None	RA: Complete. USTs Removed February 6, 1989. Site Assessment Compliance Statement filed March 3, 1989.
121	EMA	Gasoline UST No. 3	None	None	None	None	None	RA: Complete. USTs Removed February 6, 1989. Site Assessment Compliance Statement filed March 3, 1989.
122	EMA	Gasoline UST No.4	None	None	None	None	None	RA: Complete. USTs Removed February 6, 1989. Site Assessment Compliance Statement filed March 3, 1989.
123	EMA	Mop Station No. 1a	Soil	None	None	None	None	RI: Phase 3 delineation sampling completed in 2008 / 2009. No exceedances of NR and IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
124	EMA	Mop Station No. 1b	Soil	Lead, Mercury	Soil	None	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
125	EMA	Mop Station No. 1c	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
126	EMA	Mop Station No. 1d	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
127	EMA	Mop Station No. 1e	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
128	EMA	Mop Station No. 1f	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
129	EMA	Mop Station No. 1g	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
130	EMA	Mop Station No. 1h	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
131	EMA	Mop Station No. 1i	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.



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132	EMA	Mop Station No.1j	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. No exceedances of NR SRS. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
133	EMA	Mop Station No. 1k	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
134	EMA	Mop Station No. 1l	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
135	EMA	Mop Station No. 1m	Soil	Lead, Mercury	Soil	None	None	RI: IPhase 1 Remedial Investigation completed in 2002. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
136	EMA	Mop Station No. 1n	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. Lead detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
137	EMA	Mop Station No. 1o	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
138	EMA	Biazzi Alcohol Water Shed	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No exceedances of NR SRS. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
139	EMA	Mop Station No. 12a	Soil	Beryllium, Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of NR SRS. Beryllium, Lead, and Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
140	EMA	Mop Station No. 13a (within AOC 164)	Soil	Benzo(a)pyrene, Lead, Mercury	Soil	None	None	RI: No further action is requested from NJDEP for this AOC because this site was excavated and removed and confirmation samples were collected. Although this site was never investigated, the mop station was removed during the building demolition, and all soils in this area were excavated during the remediation of on-site Acid Brook, Area 6. Response letter from NJDEP requests this AOC be revisited for additional analysis. Investigation completed during Phase 3 delineation sampling completed in 2008 / 2009. Lead and Mercury detected in excess of IGW SRS. Benzo(a)pyrene detected in excess of the NR SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
141	EMA	Mop Station No. 14a	Soil	Beryllium, Lead, Mercury, Selenium	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of NR SRS. Beryllium, Lead, Mercury, Selenium detected in excess of the IGW SRS. Delineation in combination with AOC 166. Remedial investigation completed. Remedial investigation report submitted June 2010.
142	EMA	Mop Station No. 15a (within AOC 165)	Soil	PAHs, Beryllium, Cadmium, Lead, Mercury, Selenium, Zinc	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Benzo(a)pyrene, Dibenz(a,h)anthracene, Lead, Mercury detected in excess of NR SRS. Benzo(a)anthracene, Benzo(a)pyrene, Dibenz(a,h)anthracene, ) Beryllium, Cadmium, Lead, Mercury, Selenium, Zinc detected in excess of IGW SRS. Delineation to NR SRS complete. Delineation in combination with AOC 54 and AOC 165. Remedial investigation completed. Remedial investigation report submitted June 2010.
143	EMA	Powder Sump Tank #1	Soil	Benzo(a)pyrene, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Zinc	Soil	Direct Contact	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Tetrachloroethylene, Trichloroethene, Benzo(a)pyrene and Lead were detected in excess of the NR SRS. Cist 1,2-dichloroethene, Methyl Ethyl Ketene, Tetrachloroethylene, Trichloroethene, Vinyl Chloride, Benzo(a)pyrene, Nitrosodiphenylamine, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver and Zinc were detected in excess of the IGW SRS. Delineated in combination with AOCs 72 and 144. Remedial investigation completed. Remedial investigation report submitted June 2010.

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144	EMA	Powder Sump Tank # 2	Soil	Benzo(a)pyrene, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Zinc	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Tetrachloroethylene, Trichloroethene, Benzo(a)pyrene and Lead were detected in excess of the NR SRS. Cist 1,2-dichloroethene, Methyl Ethyl Ketene, Tetrachloroethylene, Trichloroethene, Vinyl Chloride, Benzo(a)pyrene, Nitrosodiphenylamine, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver and Zinc were detected in excess of the IGW SRS. Delineated in combination with AOCs 72 and 143. Remedial investigation completed. Remedial investigation report submitted June 2010.
145	WMA	Tunnel Residue Dump	Soil	Lead	Soil	None	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
146	WMA	Lakefront Magazine 1	Soil	Lead, Arsenic, Copper	Soil	Direct Contact	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Additional delineation sampling implemented in the 4th quarter of 2009. Additional delineation sampling performed 4th quarter of 2009 through 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.
147	WMA	Lakefront Magazine 2	Soil	Lead, Arsenic, Copper, Thallium, Zinc	Soil	Direct Contact	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Additional delineation sampling performed 4th quarter of 2009 through 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.
148	WMA	Lakefront Magazine 3	Soil	Lead	Soil	None	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
149	WMA	Lakefront Magazine 4	None	None	None	None	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
150	WMA	Lakefront Magazine 5	None	None	None	None	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
151	WMA	Lakefront Magazine 6	Soil	Lead, Copper, Thallium, Antimony	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.
152	EMA	Area under foundation FA-1200	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead detected in excess of NR SRS. Lead and mercury detected in excess of the IGW SRS. Delineation in combination with AOC 153. Remedial investigation completed. Remedial investigation report submitted June 2010.
153	EMA	Area around and east of FA-113	Soil	Lead, Mercury, Selenium	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead detected in excess of the NR SRS. Lead, mercury and selenium detected in excess of the IGW SRS. Delineation to NR SRS complete. Delineation in combination with AOC 153. Remedial investigation completed. Remedial investigation report submitted June 2010.



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154	EMA	Area around and east of FA-118	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead detected in excess of NR SRS. Lead and mercury detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
155	EMA	Area around and under FA-1330	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead detected in excess of NR SRS. Lead and mercury detected in excess of the IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
156	EMA	Area south of FA-1068	Soil	Lead	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No compounds detected in excess of NR SRS. Lead detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
157	EMA	Drain and swale at FA-1152	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No compounds detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
158	EMA	Area below FA-154	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No compounds detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
159	EMA	Alcohol drain in FA-172	Soil	Lead, Mercury	Soil	None	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2002. No compounds detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
160	EMA	Area of FA-1090	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No compounds detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
161	EMA	Area between FA-200 and FA-160	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2002. No compounds detected in excess of NR SRS. Mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
162	EMA	Area around and under FA-203	Soil	PAHs, Beryllium, Lead, Mercury, Selenium	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene and Lead detected in excess of NR SRS. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Beryllium, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Lead, Mercury, and Selenium detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
163	EMA	Area around FA-1193	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2002. Mercury detected in excess of NR SRS. Lead and mercury detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
164	EMA	Area around and under FA-287	Soil	PAHs, Beryllium, Lead, Mercury, Selenium	Soil	Direct Contact	None	RI: Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Lead and Mercury detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Beryllium, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Lead, Mercury and Selenium detected in excess of IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010..
165	EMA	Area around FA-206	Soil	Beryllium, Lead, Mercury, Selenium	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Lead and Mercury detected in excess of the NR SRS. Beryllium, Lead, Mercury and Selenium detected in excess of IGW SRS. Delineation in combination with AOC 54 and AOC 142. Remedial investigation completed. Remedial Investigation report submitted June 2010.
166	EMA	Area east of FA-209	Soil	Benzo(a)anthracene, Benzo(a)pyrene, Beryllium, Cadmium, Lead, Mercury, Selenium	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene and Mercury were detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(a)pyrene, Beryllium, Cadmium, Lead, Mercury and Selenium were detected in excess of the IGW SRS. Delineation in combination with AOC 54 and AOC 142. Remedial investigation completed. Remedial Investigation report submitted June 2010.

## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
167	EMA	Area between FA-1098 and barricade	Soil	PAHs, Aluminum, Beryllium, Cadmium, Lead, Magnesium, Mercury, Selenium, Thallium, Zinc	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Tetrachloroethylene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Lead and Mercury were detected in excess of NR SRS. Cis-1,2 Dichloroethene, Tetrachloroethylene, Trichloroethene, Vinyl Chloride, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Aluminum, Beryllium, Cadmium, Lead, Magnesium, Mercury, Selenium, Thallium and Zinc were detected in excess of the IGW SRS. Delineation to NR SRS generally complete. Remedial investigation completed. Remedial Investigation report submitted June 2010.
168	EMA	3 Dry wells behind FA-1034	Soil	Aluminum, Beryllium, Manganese, Mercury	Soil	Direct Contact	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Mercury was detected in excess of the NR SRS. Tetrachloroethylene, Trichloroethene, Aluminum, Beryllium, Manganese and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
169	EMA	Drain in FA-1034	None	None	None	None	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2002-2007. Remedial investigation completed. Remedial Investigation report submitted June 2010. Addressed in AOC 186 - Storm Sewers
170	EMA	Tank area near FA-1034	Soil	Benzo(a)pyrene	Soil	Direct Contact	Direct Contact	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2002-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene was detected in excess of the NR and IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
171	EMA	Area around FA-1132	Soil	PAHs, Beryllium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Zinc	Soil	Direct Contact	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Copper and Lead were detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-CD) Pyrene, Beryllium, Copper, Lead, Mercury, Nickel, Selenium, Silver and Zinc were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
172	EMA	Drain in FA-537	None	None	None	None	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2002-2007. Remedial investigation completed. Remedial Investigation report submitted June 2010. Addressed in AOC 186 - Storm Sewers
173	EMA	Powerhouse	Soil	Benzo(a)pyrene, Benzo(a)anthracene, Beryllium, Lead, Mercury, Nickel.	Soil	None	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. Benzo(a)pyrene was detected in excess of the NR SRS. Benzo(a)anthracene, Benzo(a)pyrene, Methylene Chloride, Tetrachloroethylene, Trichloroethene, Beryllium, Lead, Mercury and Nickel were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
174	EMA	Area under FA-424	Soil	Tetrachloroethylene	Soil	None	Groundwater	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. No compounds were detected in excess of the NR SRS. Tetrachloroethylene was detected in excess of the IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
175	EMA	FA-406 including drain	Soil	Aluminum, Beryllium, Cadmium, Lead, Manganese, Mercury	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Lead and Mercury were detected in excess of NR SRS. Carbon Tetrachloride, Tetrachloroethylene, Trichloroethene, Aluminum, Beryllium, Cadmium, Lead, Manganese and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
176	EMA	Area under FA-416	Soil	PAHs	Soil	Direct Contact	None	RI: Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2002-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene and Dibenz(a,h)anthracene were detected in excess of the NR SRS. 1,1-Dichloroethene, Tetrachloroethylene, Trichloroethene, Benzo(a)anthracene, Benzo(a)pyrene, Dibenz(a,h)anthracene were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
177	EMA	Area south of FA-595	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NR SRS. Methylene Chloride, Lead and Mercury were detected in excess of IGW SRS.
178	EMA	Area south of FA-446	Soil	None	None	None	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NR SRS. Methylene Chloride was detected in excess of IGW SRS.



## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
179	EMA	Drain in FA-1047 and FA-1220	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NRDC SCC in effect at the time the RIR was submitted. Remedial investigation completed. Remedial Investigation report submitted June 2010.
180	EMA	Aboveground Storage Tank/drain in FA-789	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NRDC SCC in effect at the time the RIR was submitted. Methylene Chloride, Lead and Mercury were detected in excess of IGW SRS.
181	EMA	Area around FA-554 and FA-1057	Soil	Lead, Mercury	Soil	Direct Contact	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NR SRS. Methylene Chloride, Lead and Mercury were detected in excess of IGW SRS.
182	ABV	Transformers	Soil	PCBs	Soil	Direct Contact	None	RI: The document "Former Operating Area Preliminary Assessment Report", was submitted to NJDEP April 17, 1995. Data submitted to NJDEP Oct 2002. Phase 1 Remedial Investigation performed in 2001. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. PCB 1248, PCB 1254, PCB 1260 were detected in excess of the NR and IGW SRS. Remedial investigation completed. Remedial investigation report submitted June 2010.
183	EMA	Storm Water Detention Basin	Soil	Lead, Mercury	Soil	None	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NRDC SCC in effect at the time the RIR was submitted. Methylene Chloride, Lead and Mercury were detected in excess of IGW SRS.
184	EMA	Storm Water Detention Basin	Soil	Lead, Mercury	Soil	None	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NR SRS. Methylene Chloride, Lead and Mercury were detected in excess of IGW SRS.
185	EMA	Storm Water Detention Basin	Soil	Lead, Mercury	Soil	None	None	RI: Complete. Sampled in 2001, RIR submitted to NJDEP 2002. No analytical results were detected above the NR SRS. Tetrachloroethylene, Lead and Mercury were detected in excess of IGW SRS.
186	ABV	Storm Sewer	Soil	Mercury	Soil	None	None	RA: IRM Completed 1994. The document "Former Operating Area Preliminary Assessment Report", was submitted to NJDEP April 17, 1995. NFA Proposed for area addressed by IRM; additional delineation required outside area addressed by IRM scheduled for Spring 2008.  RI: Phase 3 delineation sampling completed in 2008 / 2009. No compounds were detected in excess of the NR SRS. Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
187	EMA	Area outside vent of FA-1250	Soil	Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2001. No compounds were detected in excess of the NR SRS. Mercury was detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
188	EMA	Area under FA-226	Soil	Benzo(a)pyrene, Dibenzo(a,h)anthracene, Beryllium, Lead, Mercury	Soil	Direct Contact	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. Phase 2 remedial investigation completed in 2002-2007. Phase 3 delineation sampling completed in 2008 / 2009. Benzo(a)pyrene, Dibenzo(a,h)anthracene, and Mercury were detected in excess of the NR SRS. Benzo(a)pyrene, Beryllium, Lead and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
189	EMA	Septic tank west of FA-1098	Soil	Aluminum, Beryllium, Lead, Manganese, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2001. Aluminum, Beryllium, Lead, Manganese and Mercury were detected in excess of the IGW SRS. Remedial investigation report scheduled for 2010. Remedial investigation completed. Remedial Investigation report submitted June 2010.
190	EMA	Area near FA-1117	Soil	Aluminum, Beryllium, Manganese, Mercury	Soil	None	None	RI: Investigation complete. Phase 1 Remedial Investigation completed in 2001. No compounds detected in excess of the NR SRS. Aluminum, Beryllium, Manganese and Mercury were detected in excess of the IGW SRS. Remedial investigation completed. Remedial Investigation report submitted June 2010.
191	EMA	Area near FA-1336	Soil	Lead, Mercury	Soil	None	None	RI: Phase 1 Remedial Investigation completed in 2001. No compounds were detected in excess of the NR SRS. Lead and Mercury were detected in excess of the IGW SRS. Remedial Investigation completed. Remedial Investigation report submitted June 2010.

## DuPont Pompton Lakes Works Case Inventory Document

AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
192	WMA	Old Fuze Works Wire Dump	Soil	PAHs, Arsenic, Copper, Lead, Mercury, Thallium	Soil	Direct Contact	Surface Water, Groundwater	RA: Interim Remedial Measures Completed January 1997, "On-Site Lake Inez Valley Areas of Concern 192 and 193 Remedial Action Report", September 1998. Additional delineation required outside IRM area for RDCSCC. "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter.  RI: Investigation complete. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
193	WMA	Old Fuze Works Miscellaneous Waste Site	Soil	PAHs, Mercury	Soil	Direct Contact	Surface Water, Groundwater	RA: Stabilization Measures Completed January 1997, "On-Site Lake Inez Valley Areas of Concern 192 and 193 Remedial Action Report", September 1998. Proposed no further action. Additional delineation required outside IRM area for RDCSCC. "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter.  RI: Phase 3 delineation sampling completed in 2008 / 2009 outside area addressed by IRM. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling performed 4th quarter of 2009 through 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.
194	WMA	Old Fuze Works Dump	Soil	PAHs, Arsenic, Copper, Lead	Soil	Direct Contact	Surface Water, Groundwater	RA: Interim Remedial Measures Completed February 1997, "On-Site Lake Inez Valley Areas of Concern 194 and 198 Remedial Action Report", February 16, 1998. Additional delineation required outside IRM area for RDCSCC. "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter.  RI: Investigation complete. Phase 3 delineation sampling completed in 2008 / 2009 outside area addressed by IRM. Remedial investigation completed. Remedial investigation report submitted December 2010.
195	WMA	Area of iron filings	Soil	PAHs, Lead, Mercury, Thallium	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on results of previous sampling events. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.
196	WMA	Police shooting range	Soil	PAHS	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.
197	WMA	Area of tar deposits	Soil	None	None	None	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Investigation complete. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
198	WMA	Area of tar deposits	Soil	PAHs, Arsenic, Copper, Lead	Soil	Direct Contact	Surface Water, Groundwater	RA: Interim Remedial Measure completed in AOC 198 Interim Measure, "On-Site Lake Inez Valley Areas of Concern 194 and 198 Remedial Action Report", February 16, 1998. Additional delineation required outside IRM area for RDCSCC. "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter.  RI: Delineation to NR SRS complete. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009 outside area addressed by IRM. Remedial investigation completed. Remedial investigation report submitted December 2010.
199	WMA	Burning area	Soil	PAHs, Arsenic, Lead, Copper, Thallium, Antimony	Soil	Direct Contact	Surface Water, Groundwater	RI: "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling performed 4th quarter of 2009 through 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted December 2010.

## DuPont Pompton Lakes Works Case Inventory Document

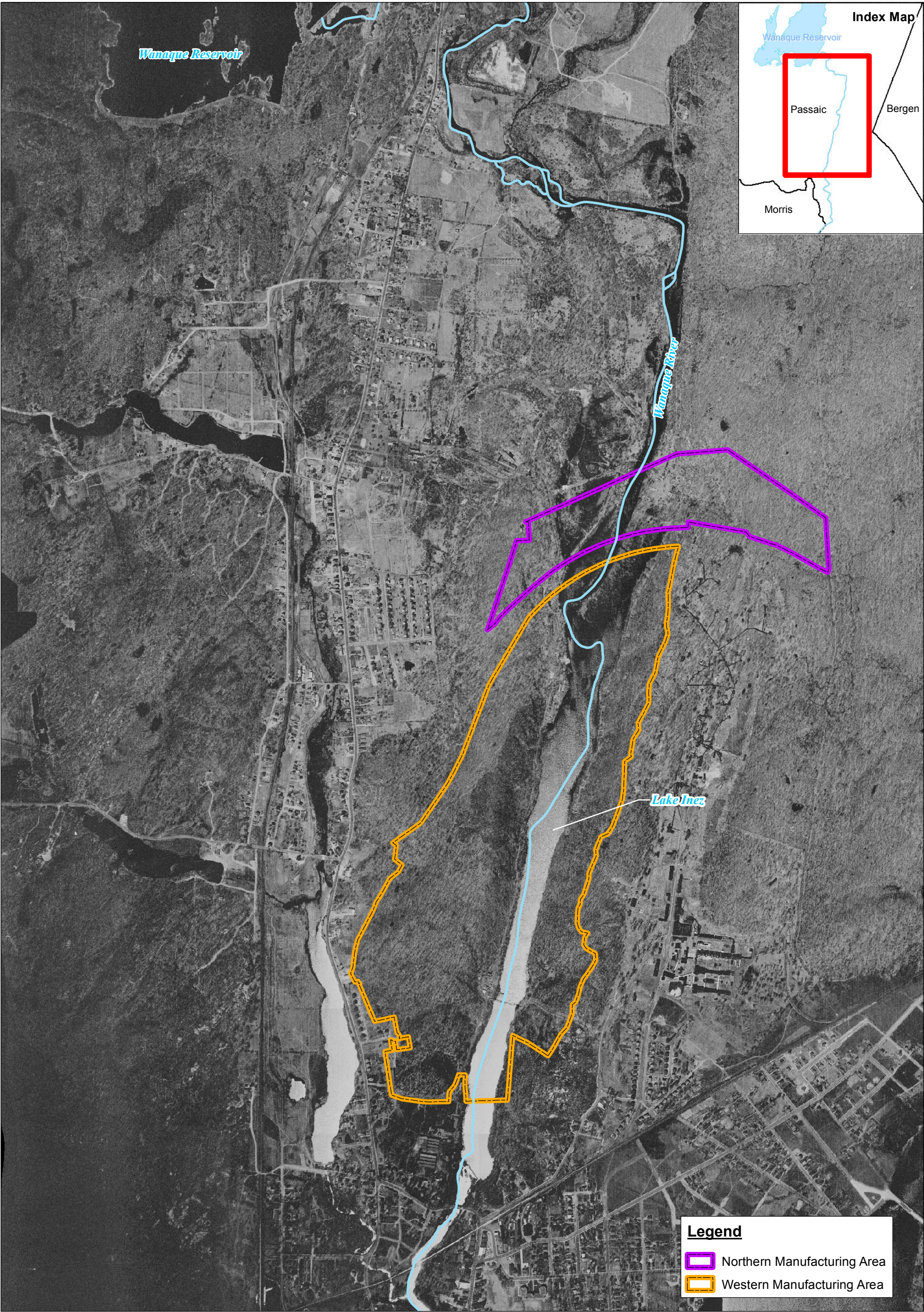
AOC Designation	Plant Region	Name	Impacted Media	Contaminants of Concern (COCs)	Exposure Route	Receptors		Current Status / Outcome
						Existing	Potential	
200	WMA	Area of former process ponds	Soil	Arsenic	Soil	Direct Contact	Surface Water, Groundwater	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
201	WMA	Unknown stone well	Soil	None	None	None	None	RI: Lake Inez Region Remedial Investigation Work Plan, dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Remedial investigation completed. Remedial investigation report submitted December 2010.
202	WMA	Unknown pit	Soil	Lead, Arsenic	Soil	Direct Contact	Surface Water, Groundwater	RI: "Lake Inez Region Remedial Investigation Work Plan", dated June 12, 2003, November 21, 2003 comment letter from NJDEP, and DuPont's December 29, 2003 response letter. Phase 2 remedial investigation completed in 2003-2007. Phase 3 delineation sampling completed in 2008 / 2009. Further investigation necessary based on change in June 2008 NJDEP impact to soil screening criteria. Additional delineation sampling begun in the 4th quarter of 2009 scheduled for completion in the 1st quarter of 2010. Remedial investigation completed. Remedial investigation report submitted June 2010.
<b>II. Other Issues Tracked</b>								
Vapor Intrusion Issues	Offsite	--	Indoor Air	PCE and daughter compounds	Vapors			Subject of ongoing investigation and mitigation measures. VI RIR and VI IRM Report submitted December 2010.
Classification Exception Area #1	EMA North	CEA #1	Groundwater	Lead	Direct Contact, Ingestion, Inhalation	None	None	Comprehensive Ground Water Monitoring Program in place including semi-annual sampling program with annual reporting in February. The 2009 Ground Water Monitoring Report was submitted in February 2010. The Classification Exception Area - Biennial Certification was submitted in April 2010.
Classification Exception Area #2	EMA Middle	CEA #2	Groundwater	Chlorinated VOCs	Direct Contact, Ingestion, Inhalation	None	None	Comprehensive Ground Water Monitoring Program in place including semi-annual sampling program with annual reporting in February. The 2009 Ground Water Monitoring Report was submitted in February 2010. The Classification Exception Area - Biennial Certification was submitted in April 2010.
Classification Exception Area #3	EMA South	CEA #3	Groundwater	Chlorinated VOCs	Direct Contact, Ingestion, Inhalation	None	None	Comprehensive Ground Water Monitoring Program in place including semi-annual sampling program with annual reporting in February. The 2009 Ground Water Monitoring Report was submitted in February 2010. The Classification Exception Area - Biennial Certification was submitted in April 2010.
Classification Exception Area #4	Offsite	CEA #4	Groundwater	Chlorinated VOCs	Direct Contact, Ingestion, Inhalation	None	None	Comprehensive Ground Water Monitoring Program in place including semi-annual sampling program with annual reporting in February. The 2009 Ground Water Monitoring Report was submitted in February 2010. The Classification Exception Area - Biennial Certification was submitted in April 2010.
Wanaque River	Offsite	--	Sediment	Mercury	Sediment	None	Ecological	RI: Remedial Investigation completed in 2010. Remedial investigation completed. Remedial Investigation Report submitted July 2010 and revised August 2011.
<u>Acronyms:</u> AOC - Area of Concern IGW SRS - Impact to Groundwater Soil Remediation Standard IRM - Interim Remedial Measure NRDCSCC - Non Residential Direct Contact Soil Cleanup Criteria NJDEP - New Jersey Department of Environmental Protection NR SRS - Non Residential Soil Remediation Standard PA - Preliminary Assessment PCBs - Polychlorinated Biphenyls						RA- Remedial Action RAWP - Remedial Action Work Plan RCRA - Resource Conservation and Recovery Act RDCSCC - Residential Direct Contact Soil Cleanup Criteria RDC SRS - Residential Direct Contact Soil Remediation Standard PETN - pentaerythritol tetranitrate RDX - Cyclotrimethylenetrinitramine		



**Appendix C**

**Historical Aerial Photographs**

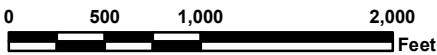




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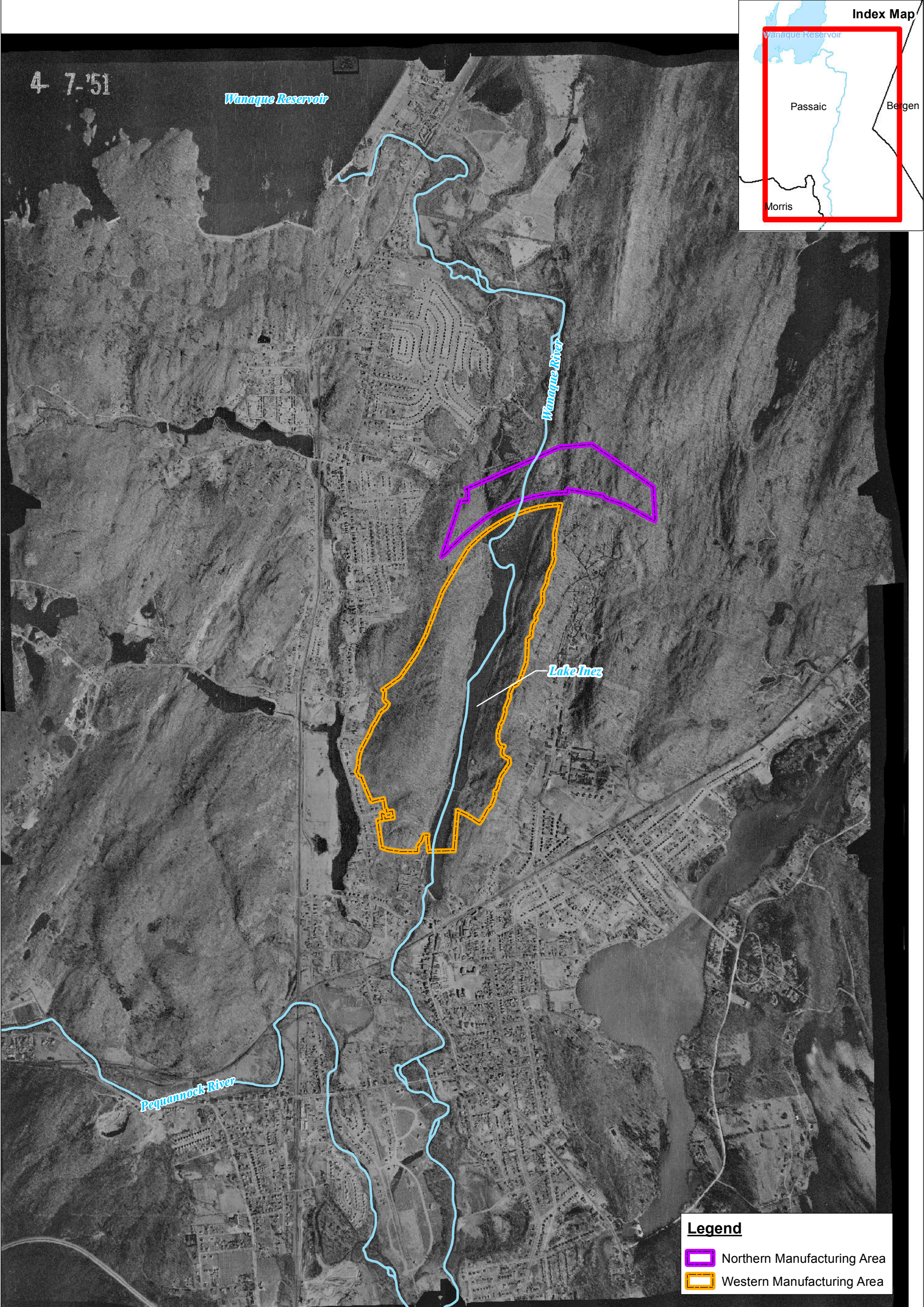
PROJECT NO. 18985452.00004



1 in = 1,000 ft

**Appendix C-1**  
**1940 Aerial Photograph**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

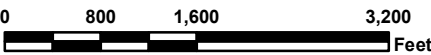




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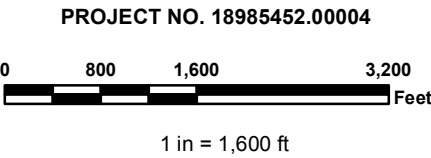
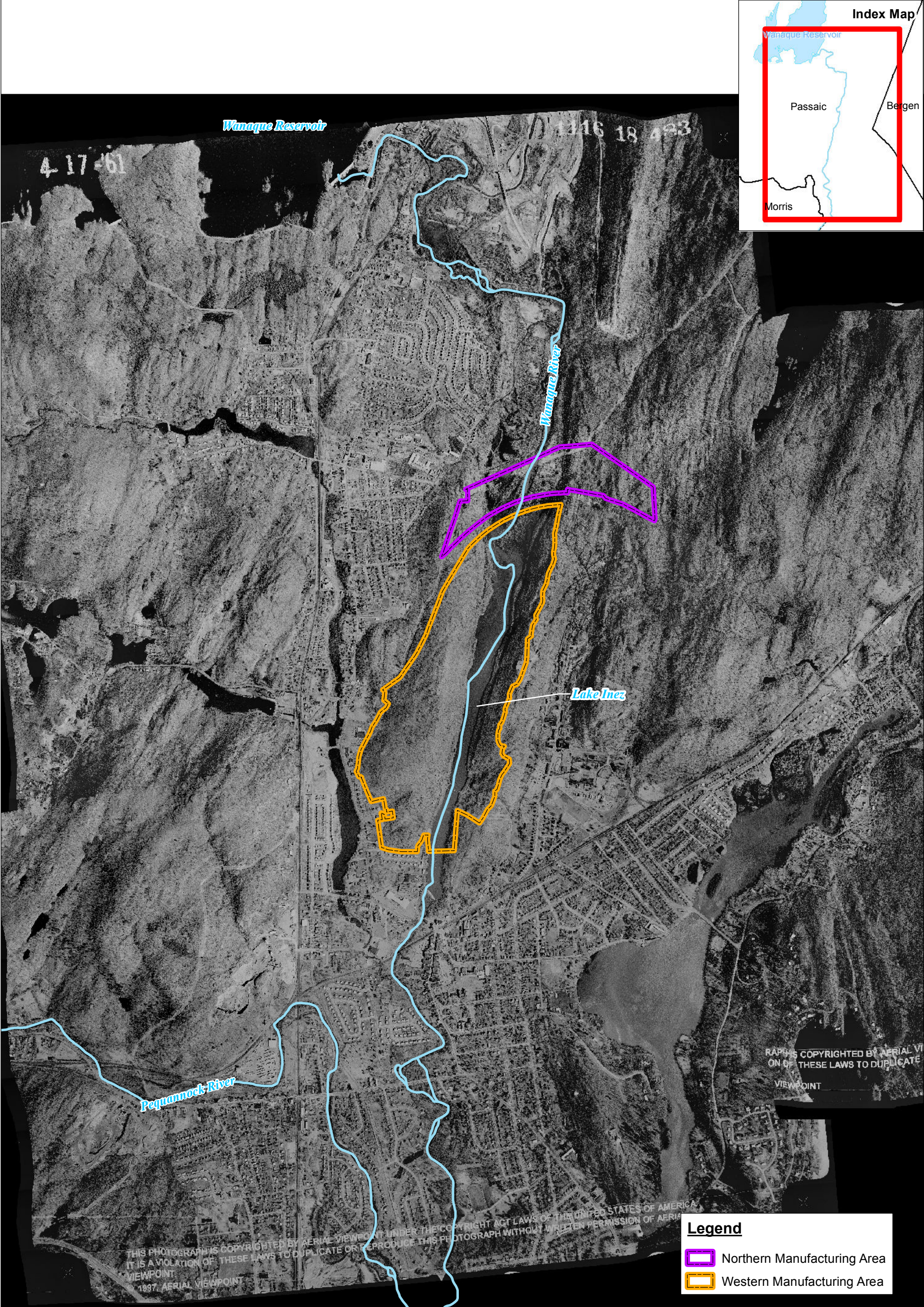
PROJECT NO. 18985452.00004



1 in = 1,600 ft

Appendix C-2  
1951 Aerial Photograph  
Wanaque River  
Remedial Investigation Report  
DuPont Pompton Lakes Works  
Pompton Lakes, New Jersey



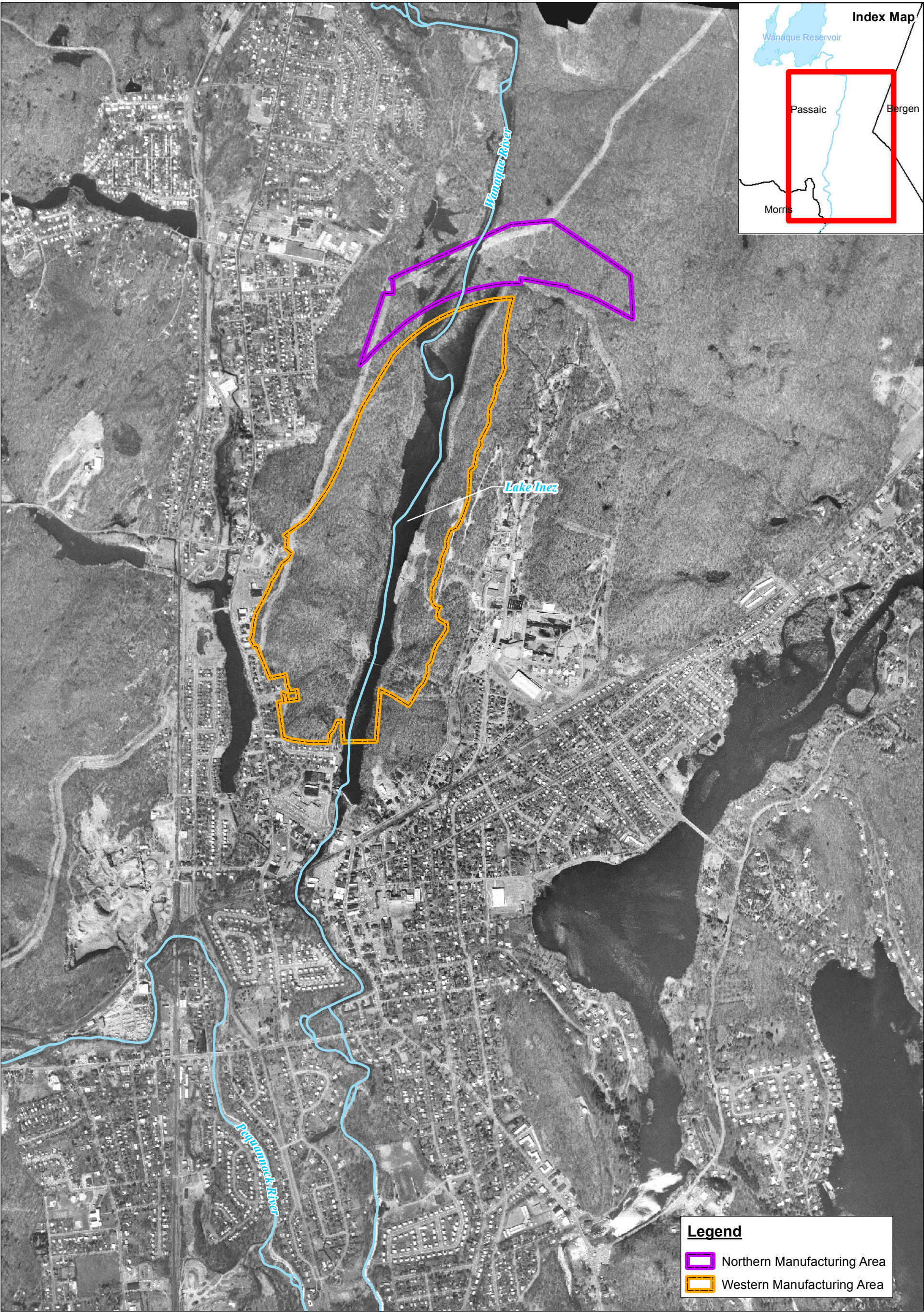


**Legend**

- Northern Manufacturing Area
- Western Manufacturing Area

**Appendix C-3**  
**1961 Aerial Photograph**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**

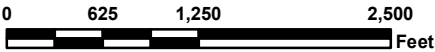




**URS**



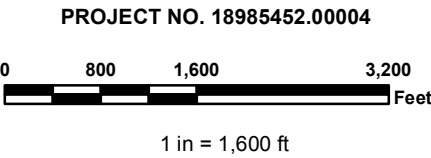
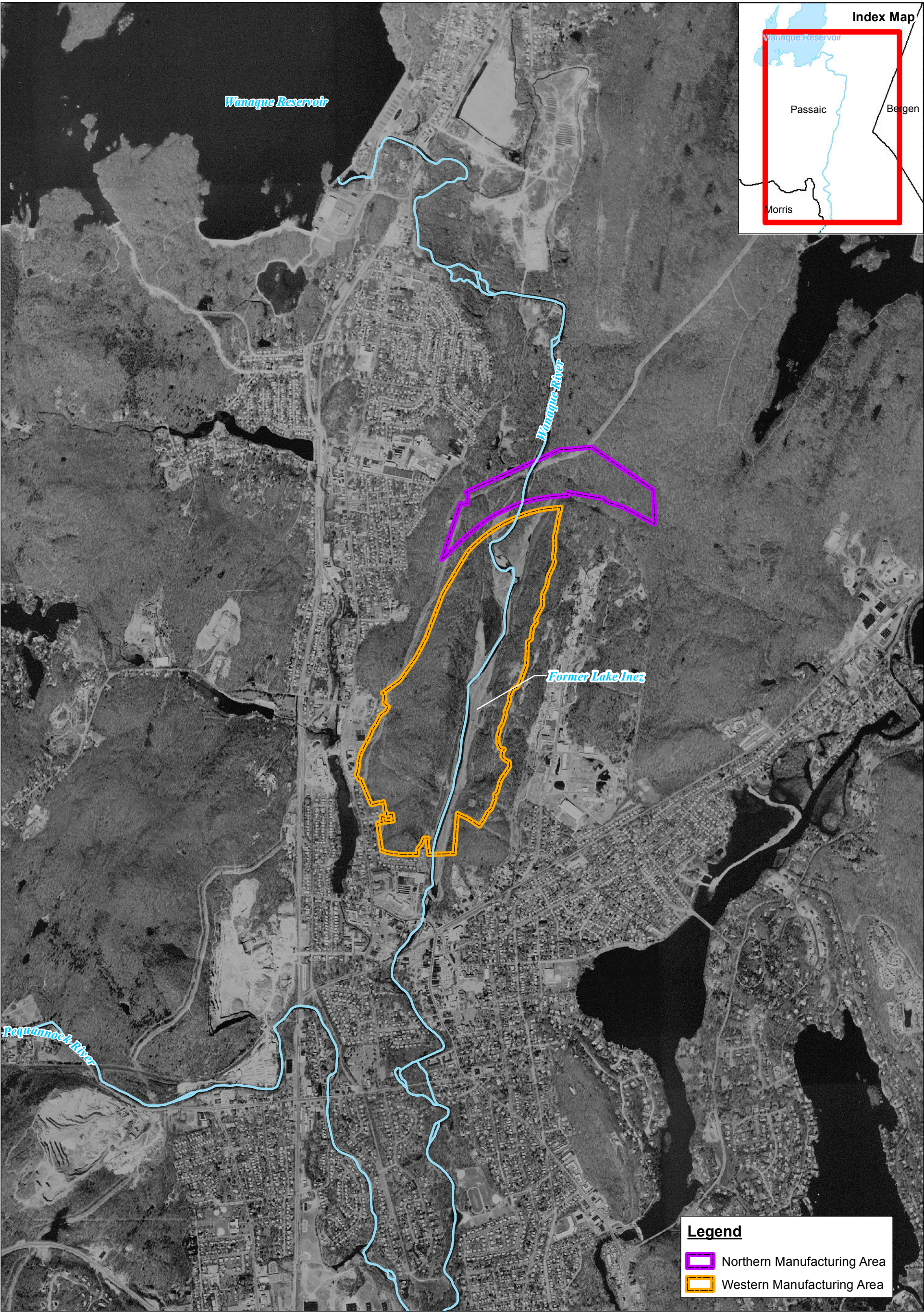
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1 in = 1,250 ft

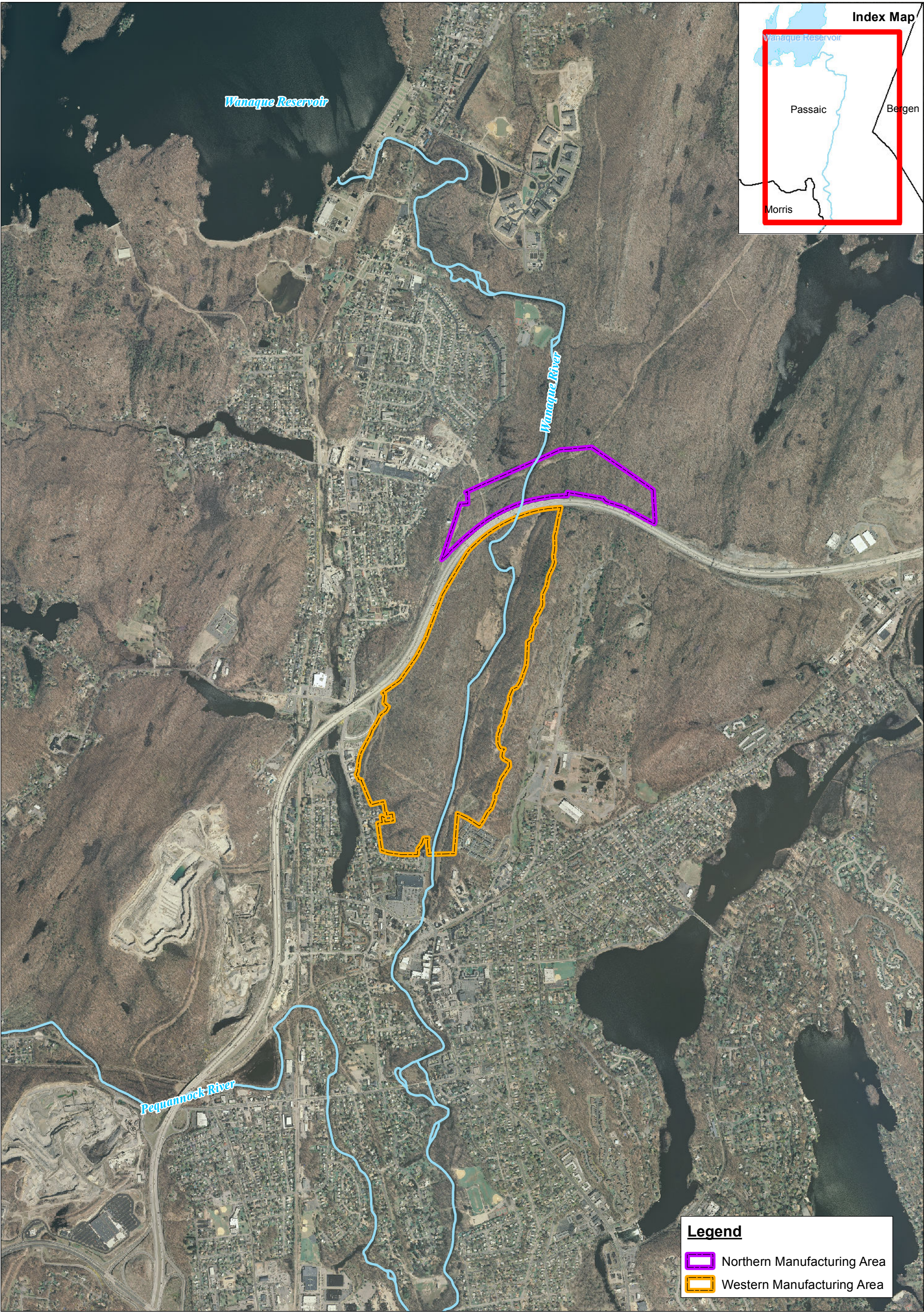
**Appendix C-4**  
**1971 Aerial Photograph**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



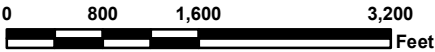


**Appendix C-5**  
**1986 Aerial Photograph**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**





PROJECT NO. 18985452.00004



1 in = 1,600 ft

**Appendix C-6**  
**2007 Aerial Photograph**  
**Wanaque River**  
**Remedial Investigation Report**  
**DuPont Pompton Lakes Works**  
**Pompton Lakes, New Jersey**



**Appendix D**  
**Field Data Sheets**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-01</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 Reach 2 Reach 3	
FORM COMPLETED BY: Long Collins		DATE: 12/2/09 TIME: 1000	WATER DEPTH: 0.8'

<b>WEATHER CONDITIONS</b> <i>2000 ~ 35°F</i> <i>OVERCAST</i>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No <i>5/22/2011</i>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>35</u> °F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

**WATER QUALITY PARAMETERS**

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	8.88	/	
DO (mg/L):	10.93		Color: <del>LIGHT</del> <sup>2+</sup> BROWN
DO (% Saturation):	94.3		
pH:	7.39		Odor: NONE
Conductivity (mS/cm):	0.1164		
ORP (mV):	+ 128.8		Other: SOME SHEENING ACROSS PITCH - SWIRLING
		1 READING	

## SURFACE WATER ANALYSES

Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? (Y) N )

POM-W-WR- 01 -MS

POM-W-WR- 01 -MSD

- 01 - DIS - MS  
- 01 - DIS - MSD

**NOTES:**

PHOTO 1: UPS VIEW TOWARDS WR01

Depth constant uniform across transect; samples center of pond



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-02</b>		NORTHING:		EASTING:	
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 Reach 2 Reach 3			
FORM COMPLETED BY: Long Collins		DATE: 12/2/09 TIME: 1115		WATER DEPTH: 1.5'	

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<u>Yes</u> No <i>SNOW/RA</i>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>35</u> °F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/> clear/sunny		

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	7.07		
DO (mg/L):	11.63		Color: STAINED BROWN (LIGHT)
DO (% Saturation):	96.1		
pH:	7.24		Odor: NONE
Conductivity (mS/cm):	0.198		
ORP (mV):	+114.7		Other:
		1 REMAINING	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 0.75'

QA/QC:

Duplicate Sample Station? (Y/N) N

POM-W-WR- -DUP

MS/MSD Sample Station? (Y/N) N

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

PHOTO Z: FACING UPS

SHAPED THIN W/ ADJACENT TO BK WATER AREA

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR- 03</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1      Reach 2      Reach 3	
FORM COMPLETED BY: Long Collins		DATE: 12/7/09 TIME: 1145	WATER DEPTH: 1.1'

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes/ No <i>14/5 PM</i>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <i>~35</i> °F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	6.92	/	
DO (mg/L):	11.46		Color: BROWN STAINING (LIGHT)
DO (% Saturation):	94.3		
pH:	7.26		Odor: NONE
Conductivity (mS/cm):	0.197		
ORP (mV):	+110.9		Other:
		1 READING	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 0.65'

QA/QC:  
 Duplicate Sample Station? (Y N)  
 POM-W-WR- -DUP  
 MS/MSD Sample Station? (Y N)  
 POM-W-WR- -MS  
 POM-W-WR- -MSD

NOTES:

PHOTO 4: FACILE UPS

SAMPLED CENTER OF FLOW / THALWEG UPS GRASSY / SNAG



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR-04					
INVESTIGATORS:		RIVER REACH:			
Long Collins		Reach 1      Reach 2      Reach 3			
FORM COMPLETED BY:		DATE: 12/7/09		WATER DEPTH:	
Long Collins		TIME: 1215		1.9'	

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No 145 SA
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature 35°F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	7.04	/	
DO (mg/L):	11.45		Color: LIGHT BROWN
DO (% Saturation):	94.5		
pH:	7.23		Odor: NONE
Conductivity (mS/cm):	0.199		
ORP (mV):	+104.7		Other:
		1 READING	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): ~ 0.95'

QA/QC:

Duplicate Sample Station? ( Y / ☒ N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / ☒ N )

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

~~PHOTO 5: FEMALE UPS~~ NO PHOTO TAKEN FOR SW  
SAMPLED THALWEB

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR-05					
INVESTIGATORS:		RIVER REACH:			
Long Collins		Reach 1 Reach 2 Reach 3			
FORM COMPLETED BY:		DATE:		WATER DEPTH:	
Long Collins		12/2/09 1245		3.8	

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<u>Yes</u> / No <i>HS snow</i>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>~35</u> °F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other: _____
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	7.06	/	
DO (mg/L):	11.5		Color: BROWN - LIGHT
DO (% Saturation):	94.9		
pH:	7.16		Odor: NONE
Conductivity (mS/cm):	0.200		
ORP (mV):	+ 117.0		Other:
		1 Remaining	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): - 1.9'

**QA/QC:**

Duplicate Sample Station? ( Y ☒ N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y ☒ N )

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

Photo 5: Facing ups

Similar pattern of flow adjacent to skimmer along - depth relatively uniform across channel



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-060</b>		NORTHING:		EASTING:	
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 Reach 2 Reach 3			
FORM COMPLETED BY: Long Collins		DATE: 12/7/09 TIME: 1310		WATER DEPTH: 2.6	
WEATHER CONDITIONS		Now      Past 24 hours <input type="checkbox"/> <input type="checkbox"/> storm <input type="checkbox"/> <input type="checkbox"/> rain <input type="checkbox"/> <input type="checkbox"/> showers <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> partly cloudy <input type="checkbox"/> <input type="checkbox"/> clear/sunny		Has there been a heavy rain in the last 7 days? (Yes) No 12/5 snow Air Temperature 35-40°F Other:	
WATER QUALITY PARAMETERS					
Parameter	MID Near-Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:		
Temperature (°C):	6.85	/			
DO (mg/L):	11.05		Color: BROWN (LIGHT)		
DO (% Saturation):	90.4				
pH:	7.18		Odor: SWEET SEWAGE ODOR		
Conductivity (mS/cm):	0.215				
ORP (mV):	+49.7		Other:		
		1 READING			

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 1.3

QA/QC:

Duplicate Sample Station? (Y/N) ☒ N

POM-W-WR- -DUP

MS/MSD Sample Station? (Y/N) ☒ N

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

PHOTO 7: UPS VIEW

SAMPLE NEAR CENTER OF FLOW TNS OF WWTP DISCHARGE PIPE; SWEET

SEWAGE ODOOR NOTED

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:	EASTING:
POM-W-WR- 07			
INVESTIGATORS:		RIVER REACH:	
Long	Collins	Reach 1	Reach 2      Reach 3
FORM COMPLETED BY:		DATE:	WATER DEPTH:
Long	Collins	12/7/09 1340	1.4'

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes/ No <i>Yes snow/rain</i>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <i>~ 35-40</i> °F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	6.80	/	
DO (mg/L):	11.68		Color: LIGHT BROWN
DO (% Saturation):	95.9		
pH:	7.23		Odor: SLIGHT SEWAGE ODOR
Conductivity (mS/cm):	0.214		
ORP (mV):	+122.7		Other:
		ENDING	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): ~ 0.7'

QA/QC:

Duplicate Sample Station? (Y ☒ N)

POM-W-WR- -DUP

MS/MSD Sample Station? (Y ☒ N)

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

PHOTO 8 - FACING UPS

SAMPLED THROUGH MUD PB WHERE FLOW WAS GREATEST ACROSS CHANNEL



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:  POM-W-WR-08		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 Reach 2 Reach 3	
FORM COMPLETED BY: Long Collins		DATE: 12/2/09 TIME: 1405	WATER DEPTH: 1.6'

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes No 12/5 snow
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature 35-40°F
	<input type="checkbox"/>	<input type="checkbox"/> showers	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	6.74	/	
DO (mg/L):	11.64		Color: LIGHT BROWN; MORE COOL
DO (% Saturation):	95.3		WE-07
pH:	7.22		Odor: SLIGHT SWAMP, LESS THAN
Conductivity (mS/cm):	0.214		WE-07
ORP (mV):	+ 131.6		Other:
		1 READING	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): ~ 0.8'

QA/QC:  
 Duplicate Sample Station? (Y/N) Y  
 POM-W-WR- 08 -DUP  
-08-115-DUP  
 MS/MSD Sample Station? (Y/N) N  
 POM-W-WR- -MS  
 POM-W-WR- -MSD

NOTES:

Photo 9: Facing UPS  
SAMPLED IN CENTER OF FLOW ADJACENT TO BLUE WATER

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR-09					
INVESTIGATORS:		RIVER REACH:			
Long Collins					
		Reach 1		Reach 2	
FORM COMPLETED BY:		DATE: 12/2/09		WATER DEPTH:	
Long Collins		TIME: 1440		1'	

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No <i>12/5 RAIN/SNOW</i>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <i>~35-40</i> °F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

WATER QUALITY PARAMETERS			
Parameter	Near-Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	6.61	/	
DO (mg/L):	11.67		Color: <u>CLEAR</u>
DO (% Saturation):	95.4		
pH:	7.18		Odor: <u>SLIGHT SEWAGE ODOR</u>
Conductivity (mS/cm):	0.213		
ORP (mV):	+ 119.1		Other:
		1 READING	

## SURFACE WATER ANALYSES

Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

 $\sim 0.5'$ 

**QA/QC:**

Duplicate Sample Station? ( Y N )

POM-W-WR-

-DUP

MS/MSD Sample Station? ( Y ☒ N )

POM-W-WR-

-MS

POM-W-WR-

-MSD

**NOTES:**

Photo 10: Facing UPS



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:	EASTING:
POM-W-WR-10			
INVESTIGATORS:		RIVER REACH:	
Long	Collins	Reach 1	Reach 2
FORM COMPLETED BY:		DATE: 12/18/09	WATER DEPTH:
Long	Collins	TIME: 1100	1.6

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / <u>No</u>
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>~70</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other:
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	2.5	/	
DO (mg/L):	13.30		Color: CLEAR
DO (% Saturation):	97.8		
pH:	7.33		Odor: NONE
Conductivity (mS/cm):	0.185 SC: 0.323		
ORP (mV):	+82.2		Other:

## SURFACE WATER ANALYSES

Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

et): 0.8

**QA/QC:**

Duplicate Sample Station? ( Y / N )

POM-W-WR-

-DUP

MS/MSD Sample Station? ( Y ~~(N)~~ )

POM-W-WR-

-MS

POM-W-WR-

-MSD

**NOTES:**

SAMPLED THALWEG NEAR CENTER OF FLOW

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-11</b>		NORTHING: # WAYPOINT 796877.8		EASTING: 00124 550865.4	
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1      Reach 2      Reach 3			
FORM COMPLETED BY: Long Collins		DATE: 12/18/09 TIME: 1035		WATER DEPTH: 2.3'	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / <u>No</u>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>20</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	Other:

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	2.28	/	
DO (mg/L):	13.70		Color: CLEAR
DO (% Saturation):	100.1		
pH:	7.25		Odor: NONE
Conductivity (mS/cm):	0.182 SC: 0.321		
ORP (mV):	+ 112.4		Other:

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): ~ 1.1

QA/QC:

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

SAMPLED ADJACENT TETRA WEG NEAR L13



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

<b>SAMPLE IDENTIFICATION:</b> <b>POM-W-WR- 12</b>		<b>NORTHING:</b> # water point only # <b>396130.7</b>		<b>EASTING:</b> <b>550396.2</b>	
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> Reach 1 <u>Reach 2</u> Reach 3			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> <u>12/11/07</u>		<b>WATER DEPTH:</b> <u>1.7'</u>	
<b>WEATHER CONDITIONS</b>		Now      Past 24 hours		Has there been a heavy rain in the last 7 days? Yes / <u>no</u>	
<input type="checkbox"/>		<input type="checkbox"/> storm		Air Temperature <u>~ 20</u> °F	
<input type="checkbox"/>		<input type="checkbox"/> rain		Other:	
<input type="checkbox"/>		<input type="checkbox"/> showers			
<input type="checkbox"/>		<input type="checkbox"/> partly cloudy			
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/> clear/sunny			

WATER QUALITY PARAMETERS			
Parameter	Mid Near-Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	2.07	/	
DO (mg/L):	13.77		Color: CLEAR
DO (% Saturation):	99.8		
pH:	7.23		Odor: NONE
Conductivity (mS/cm):	0.173 $\mu\text{S}$ : 0.705		
ORP (mV):	+ 94.2		Other:

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): ~ 0.8

QA/QC:

Duplicate Sample Station? ( Y / N ) ☒ N

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N ) ☒ N

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

SAMPLED CENTER OF FLOW - DEPTHS GENERALLY UNIFORM  
ACROSS TRANSVERSE

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR-13		795448.9		550270.7	
INVESTIGATORS:		RIVER REACH:			
Long Collins		<div>Reach 1</div> <div>Reach 2</div> <div>Reach 3</div>			
FORM COMPLETED BY:		DATE:		WATER DEPTH:	
Long Collins		12/18/09		1.41	
		TIME: 0940			

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / <u>No</u>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>~20</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other: _____
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	<div>MID</div> <div><del>Near Bottom</del> (1 foot above sediment)</div>	<div>Surface</div> <div>(1 foot below surface)</div>	Surface Water Characteristics:
Temperature (°C):	2.03		
DO (mg/L):	13.76		Color: CLEAR
DO (% Saturation):	99.5%		
pH:	7.11		Odor: NONE
Conductivity (mS/cm):	0.171 SC: 0.305		
ORP (mV):	+102.8		Other:

## SURFACE WATER ANALYSES

Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 0.7'

QA/QC:

Duplicate Sample Station? ( Y / ☒ N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / ☒ N )

POM-W-WR- -MS

POM-W-WR- -MSD

**NOTES:**

SAMPLED CENTER OF FLOW



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

<b>SAMPLE IDENTIFICATION:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">POM-W-WR-14</div>		<b>NORTHING:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">794642.3</div>	
<b>INVESTIGATORS:</b> Long Collins		<b>EASTING:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">550109.7</div>	
<b>FORM COMPLETED BY:</b> Long Collins		<b>RIVER REACH:</b> Reach 1 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Reach 2</span> Reach 3	
<b>DATE:</b> 12/18/09 <b>TIME:</b> 0910		<b>WATER DEPTH:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">1.2</div>	

<b>WEATHER CONDITIONS</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Now</td> <td style="width: 50%; text-align: center;">Past 24 hours</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/> storm</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/> rain</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/> showers</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/> partly cloudy</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/> clear/sunny</td> </tr> </table>	Now	Past 24 hours	<input type="checkbox"/>	<input type="checkbox"/> storm	<input type="checkbox"/>	<input type="checkbox"/> rain	<input type="checkbox"/>	<input type="checkbox"/> showers	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? Yes <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">No</span>
Now	Past 24 hours													
<input type="checkbox"/>	<input type="checkbox"/> storm													
<input type="checkbox"/>	<input type="checkbox"/> rain													
<input type="checkbox"/>	<input type="checkbox"/> showers													
<input type="checkbox"/>	<input type="checkbox"/> partly cloudy													
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny													
		Air Temperature <span style="font-size: 1.2em;">~20</span> °F Other:												

WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	1.92	/	
DO (mg/L):	14.9		Color: <span style="font-size: 1.2em;">CLEAR</span>
DO (% Saturation):	101.8		
pH:	6.99		Odor: <span style="font-size: 1.2em;">NONE</span>
Conductivity (mS/cm):	NM, GREENISH COLD		
ORP (mV):	+99.3		Other:
	BROWN MUD EVIDENCE FOR COM		

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

**Sample Depth (feet):** ~0.6'

<b>QA/QC:</b>	
Duplicate Sample Station? ( Y / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span> )	
POM-W-WR-	-DUP
MS/MSD Sample Station? ( Y / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span> )	
POM-W-WR-	-MS
POM-W-WR-	-MSD

NOTES:

SAMPLED NEAR CENTER OF FLOW

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

<b>SAMPLE IDENTIFICATION:</b> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 5px;">POM-W-WR-15</div>		<b>NORTHING:</b> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		<b>EASTING:</b> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	
<b>INVESTIGATORS:</b> <div style="display: flex; justify-content: space-between;"> <span>Long Collins</span> </div>		<b>RIVER REACH:</b> <div style="display: flex; justify-content: space-between;"> <span>Reach 1</span> <span>Reach 2</span> <span>Reach 3</span> </div>			
<b>FORM COMPLETED BY:</b> <div style="display: flex; justify-content: space-between;"> <span>Long Collins</span> </div>		<b>DATE:</b> 12/8/09 <b>TIME:</b> 1010		<b>WATER DEPTH:</b> <div style="text-align: center;">~1.5</div>	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes/No <span style="float: right;">25 snow Rain</span>	
	<input type="checkbox"/>	<input type="checkbox"/>		storm
	<input type="checkbox"/>	<input type="checkbox"/>		rain
	<input type="checkbox"/>	<input type="checkbox"/>		showers
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		partly cloudy
<input type="checkbox"/>	<input type="checkbox"/>	clear/sunny	Air Temperature <span style="float: right;">~35 °F</span> Other:	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	5.77	/	
DO (mg/L):	11.17		Color: <span style="float: right;">CLEAR</span>
DO (% Saturation):	89.3		
pH:	7.21		Odor: <span style="float: right;">None</span>
Conductivity (mS/cm):	0.201 / 0.78		
ORP (mV):	+ 73.3		Other:
		1 READING	

SURFACE WATER ANALYSES		
	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> <b>Sample Depth (feet):</b> ~0.75             </div> <div style="width: 50%;"> <b>QA/QC:</b>                Duplicate Sample Station? (Y/N) <span style="float: right;">(Y)</span>  <div style="text-align: right; margin-top: 5px;">POM-W-WR-15 -DUP</div>                 MS/MSD Sample Station? (Y/N) <span style="float: right;">(N)</span>  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>POM-W-WR-</span> <span>-MS</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>POM-W-WR-</span> <span>-MSD</span> </div> </div> </div>		

**NOTES:**  
 PHOTO 14: Facing UPS  
 DEEPEST FLOW ADJACENT TO LBS → LOCATION OF SW SAMPLE  
 UPS OF POWERLINE CLEARING



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-16</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 <u>Reach 2</u> Reach 3	
FORM COMPLETED BY: Long Collins		DATE: 12/8/09 TIME: 0945	WATER DEPTH: ~1'

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes / No <i>12/5/09</i>
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature _____ °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other:
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	5.52		
DO (mg/L):	11.44		Color: CLEAR
DO (% Saturation):	90.8		
pH:	7.13		Odor: NONE
Conductivity (mS/cm):	0.202 / 0.321		
ORP (mV):	+ 73.7		Other:
		1 READING	

## SURFACE WATER ANALYSES

Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 20.5

**QA/QC:**

Duplicate Sample Station? ( Y / ~~N~~ )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / ☒ N )

POM-W-WR- -MS

POM-W-WR- -MSD

**NOTES:**

PHOTO 13: FACING UPS

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-17</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 Reach 2 Reach 3	
FORM COMPLETED BY: Long Collins		DATE: 12/8/09 TIME: 910	WATER DEPTH: ~2'

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes / No 12/55
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>-30-35</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

WATER QUALITY PARAMETERS			
Parameter	Near-Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	5.35	/	
DO (mg/L):	11.0		Color: NONE, CLEAR
DO (% Saturation):	87.1		
pH:	7.19		Odor: NONE
Conductivity (mS/cm):	0.202 / 0.323		
ORP (mV):	+ 96.2		Other:
		1 READING	

## SURFACE WATER ANALYSES

Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / ☒ N )

POM-W-WR- -MS

POM-W-WR- -MSD

**NOTES:**

PHOTO 12: Facing UPS



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

<b>SAMPLE IDENTIFICATION:</b> <div style="border: 1px solid black; padding: 5px; display: inline-block;">POM-W-WR-018</div>		<b>NORTHING:</b> 													
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> Reach 1 <u>Reach 2</u> Reach 3													
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/8/09 <b>TIME:</b> 830													
<b>WEATHER CONDITIONS</b>		Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No    12/5 PM													
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Now</b>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/>  <input checked="" type="checkbox"/> </td> <td style="width: 50%;"> <b>Past 24 hours</b>  <input type="checkbox"/> storm  <input type="checkbox"/> rain  <input type="checkbox"/> showers  <input type="checkbox"/> partly cloudy  <input checked="" type="checkbox"/> clear/sunny           </td> </tr> </table>		<b>Now</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<b>Past 24 hours</b> <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Air Temperature <u>30</u> °F Other:											
<b>Now</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	<b>Past 24 hours</b> <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny														
<b>WATER QUALITY PARAMETERS</b>															
<b>Parameter</b>	<b>Near Bottom</b> (1 foot above sediment)	<b>Surface</b> (1 foot below surface)	<b>Surface Water Characteristics:</b>												
Temperature (°C):	5.34	/													
DO (mg/L):	10.99		Color: <u>CLEAR</u>												
DO (% Saturation):	86.7														
pH:	7.08		Odor: <u>NONE</u>												
Conductivity (mS/cm):	0.203 / 0.326														
ORP (mV):	94.9		Other:												
		1 READING													
<b>SURFACE WATER ANALYSES</b>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;">Parameter</th> <th style="width: 35%;">Unfiltered</th> <th style="width: 35%;">Filtered</th> </tr> <tr> <td>Total Hg</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Metals</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>TSS/Hardness</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td></td> </tr> </table>			Parameter	Unfiltered	Filtered	Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	TSS/Hardness	<input checked="" type="checkbox"/>		<b>QA/QC:</b> Duplicate Sample Station? ( Y / <u>N</u> ) <div style="text-align: right;">POM-W-WR-                      -DUP</div> MS/MSD Sample Station? ( Y / <u>N</u> ) <div style="text-align: right;">POM-W-WR-                      -MS</div> <div style="text-align: right;">POM-W-WR-                      -MSD</div>
Parameter	Unfiltered	Filtered													
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>													
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>													
TSS/Hardness	<input checked="" type="checkbox"/>														
Sample Depth (feet): <u>~0.5'</u>															
<b>NOTES:</b> Photo 11: Facing UPS															

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-19</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 Reach 2 Reach 3	
FORM COMPLETED BY: Long Collins		DATE: 12/8/09 TIME: 1130	WATER DEPTH: 2.4'

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No 12/5 snow / Rain
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature ~ 35 °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	Other:

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	6.45		
DO (mg/L):	12.23		Color:
DO (% Saturation):	99.5		
pH:	7.31		Odor: SLIGHT SWEET SOURCE WOOD
Conductivity (mS/cm):	0.205 / 0.318		DNS RIFLE
ORP (mV):	+118.3		Other:
		1 READING	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 2.2'

QA/QC:

Duplicate Sample Station? (Y / N)

POM-W-WR- -DUP

MS/MSD Sample Station? (Y / N)

POM-W-WR- 19 -MS

POM-W-WR- 19 -MSD

NOTES:

PHOTO

RIFFLE IMMEDIATELY UPS OF LOCATION



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR- 20</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 Reach 2 Reach 3	
FORM COMPLETED BY: Long Collins		DATE: 12/8/09 TIME: 1400	WATER DEPTH: 1.8

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>~45</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	Other:

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	16.29		
DO (mg/L):	12.13		Color: CLEAR
DO (% Saturation):	98.4		
pH:	7.22		Odor: NONE
Conductivity (mS/cm):	0.188 / 0.294		
ORP (mV):	+100.4		Other:

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 0.9

QA/QC:

Duplicate Sample Station? (Y ☒ N)

POM-W-WR- -DUP

MS/MSD Sample Station? (Y ☒ N)

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

PHOTO :

NOTED ASPHALT ODOR IN AIR  
SAMPLED IN MAIN FLOW FROM DNS FROM MOUTH OF DRIB  
ON RB



SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

SAMPLE IDENTIFICATION: <b>POM-W-WR-21</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1 <b>Reach 2</b> Reach 3	
FORM COMPLETED BY: Long Collins		DATE: <b>12/8/09</b> TIME: <b>1420</b>	WATER DEPTH: <b>~ 3.0'</b>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/>	Yes/No <b>12/5 snow (RAIN)</b>
	<input type="checkbox"/>	<input type="checkbox"/>	storm
	<input type="checkbox"/>	<input type="checkbox"/>	rain
	<input type="checkbox"/>	<input type="checkbox"/>	showers
<input type="checkbox"/>	<input type="checkbox"/>	partly cloudy	Air Temperature <b>~ 40</b> °F
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	clear/sunny	Other:

WATER QUALITY PARAMETERS			
Parameter	<b>MID</b> Near-Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	<b>6.22</b>		
DO (mg/L):	<b>12.12</b>		Color: <b>CLEAR</b>
DO (% Saturation):	<b>98.1</b>		
pH:	<b>7.17</b>		Odor: <b>NONE</b>
Conductivity (mS/cm):	<b>0.190/0.296</b>		
ORP (mV):	<b>+111.8</b>		Other:

SURFACE WATER ANALYSES			QA/QC: Duplicate Sample Station? (Y <b>N</b> ) POM-W-WR- -DUP  MS/MSD Sample Station? (Y <b>N</b> ) POM-W-WR- -MS POM-W-WR- -MSD
Parameter	Unfiltered	Filtered	
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
TSS/Hardness	<input checked="" type="checkbox"/>		
Sample Depth (feet):			

NOTES:
<b>PHOTO</b>
<b>SAMPLED MID CHANNEL @ DOWNSTREAM END OF BACKWATER AREA ON RAS</b>
<b>COULD NOT GET GPS RECEPTION -&gt; NO POINT RECORDED</b>



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR- 22</b>		NORTHING:		EASTING:	
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1      Reach 2 <u>Reach 3</u>			
FORM COMPLETED BY: Long Collins		DATE: <u>12/8/09</u> TIME: <u>1440</u>		WATER DEPTH: <u>~4.5</u>	
WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?		
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No <u>12/8 snow</u>		
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>~40</u> °F		
	<input type="checkbox"/>	<input type="checkbox"/> showers			
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other: _____		
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny			

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	6.24	/	
DO (mg/L):	11.99		Color: CLEAR
DO (% Saturation):	96.8		
pH:	7.20		Odor: NONE
Conductivity (mS/cm):	0.193 / 0.301		
ORP (mV):	+ 123.8		Other:
		1 READING	

Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 22

QA/QC:

Duplicate Sample Station? (Y N)

POM-W-WR- -DUP

MS/MSD Sample Station? (Y N)

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

PHOTO

SAMPLED IN TRAILWEG TOWARDS FB RNS OF HAMBURG TRK  
ADJACENT TO CONCRETE STAIRS TO STREAM

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-23</b>		NORTHING:		EASTING:	
INVESTIGATORS: Long Collins		RIVER REACH: Reach 1      Reach 2 <u>Reach 3</u>			
FORM COMPLETED BY: Long Collins		DATE: <u>12/8/09</u> TIME: <u>1500</u>		WATER DEPTH: <u>~1'</u>	
WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?		
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No <u>12/5 SA</u>		
	<input type="checkbox"/>	<input type="checkbox"/> rain			
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>40-45</u> °F		
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy			
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	Other:		

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	6.08	/	
DO (mg/L):	12.25		Color: clear
DO (% Saturation):	98.7		
pH:	7.20		Odor: none
Conductivity (mS/cm):	0.192 / 0.301		
ORP (mV):	+ 117.3		Other:
		1 READING	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): ~ 0.5'

**QA/QC:**

Duplicate Sample Station? ( Y ☒ N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y ☒ N )

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:

PHOTO

COLLECTED SAMPLE IN THALWEE NEAR LB



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR- 24</b>		NORTHING:	EASTING:
INVESTIGATORS: <u>Long</u> Collins		RIVER REACH: Reach 1      Reach 2 <u>Reach 3</u>	
FORM COMPLETED BY: <u>Long</u> Collins		DATE: 12/8/09 TIME: 1520	WATER DEPTH: ~ 4'

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No 12/5/09
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature ~45°F
	<input type="checkbox"/>	<input type="checkbox"/> showers	
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	5.99	/	
DO (mg/L):	11.29		Color: Clear
DO (% Saturation):	94.9		
pH:	7.25		Odor: None
Conductivity (mS/cm):	0.192 / 0.301		
ORP (mV):	* 122.6		Other:
		1 FENSINE	

SURFACE WATER ANALYSES		
Parameter	Unfiltered	Filtered
Total Hg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS/Hardness	<input checked="" type="checkbox"/>	

Sample Depth (feet): 2

QA/QC:

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR- -MS

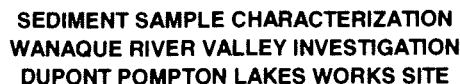
POM-W-WR- -MSD

[illegible]



SAMPLE IDENTIFICATION: <b>POM-E-WR-01</b>			NORTHING:		EASTING:	
INVESTIGATORS: Long Collins			RIVER REACH: <b>REACH 1</b> REACH 2 REACH 3			
FORM COMPLETED BY: Long Collins			DATE: 12/16/09 TIME: 0830		WATER DEPTH: ~0.5'	
WEATHER CONDITIONS		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny		Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny		
		Has there been a heavy rain in the last 7 days? <input checked="" type="radio"/> Yes / No snow/rain 12				
		Air Temperature ~20°F				
		Other:				
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample	
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	25%	
Boulder	> 256 mm (10")					
Cobble	64-256 mm (2.5-10")					
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2%	
Sand	0.06-2 mm (gritty)	60				
Silt	0.004-0.06mm	40	Marl	grey, shell fragments		
Clay	<0.004 mm (slick)					
SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:			
Substrate color: DARK BROWN BLACK			Temperature (°C): 6.67			
Substrate consistency: SILTY FINE SAND w/ CPOM			DO (mg/L): 11.95 DO (% Sat): 97.6			
Floc layer present: MINIMAL			pH: 6.63			
Moisture conditions:			Conductivity (mS/cm): 0.133 / SL 0.12			
Benthic fauna: MURKIN'S SCUBS (AMPHIPODA)			ORP (mV): +2.4			
Odors Normal Sewage Anaerobic (H <sub>2</sub> S) Petroleum Chemical Other SLURRY None						
Oils Absent Slight Moderate Profuse						
SEDIMENT ANALYSES			QA/QC:			
Parameter	0-0.5'		Duplicate Sample Station? (Y/N) POM-E-WR- -DUP			
THg + Metals	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N) POM-E-WR- -MS POM-E-WR- -MSD			
AVS/SEM	<input checked="" type="checkbox"/>					
Grain Size/TOC	<input checked="" type="checkbox"/>					
NOTES:						





SAMPLE IDENTIFICATION: <b>POM-E-WR-02</b>		NORTHING:		EASTING:	
INVESTIGATORS: Long Collins		RIVER REACH: <b>REACH 1</b> REACH 2 REACH 3			
FORM COMPLETED BY: Long Collins		DATE: 12/14/09 TIME: 09:00		WATER DEPTH: 1.1	
WEATHER CONDITIONS		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny		Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	
		Has there been a heavy rain in the last 7 days? <input checked="" type="radio"/> Yes <input type="radio"/> No 12/9 snow			
		Air Temperature ~20 °F			
		Other:			
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	~ 10%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1 - 2%
Sand	0.06-2 mm (gritty)	25			
Silt	0.004-0.06mm	70	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	5			
SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:		
Substrate color: DARK BROWN / BLACK			Temperature (°C): 4.6		
Substrate consistency: SILT w/ SOME FINE SAND CPOM			DO (mg/L): 12.44 DO (% Sat): 96.5		
Floc layer present: SLIGHT 1-2 mm			pH: 7.11		
Moisture conditions:			Conductivity (mS/cm): 0.167 / SC: 0.223		
Benthic fauna: NONE OBSERVED			ORP (mV): -249.8 ?		
Odors Normal Sewage Petroleum Chemical (Anaerobic (H <sub>2</sub> S)) None Other SLIGHT					
Oils Absent Slight Moderate Profuse					
SEDIMENT ANALYSES			QA/QC:		
Parameter	0-0.5'		Duplicate Sample Station? (Y/N) <b>N</b>		
THg + Metals	<input checked="" type="checkbox"/>		POM-E-WR- -DUP		
AVS/SEM	<input checked="" type="checkbox"/>				
Grain Size/TOC	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N) <b>N</b>		
			POM-E-WR- -MS		
			POM-E-WR- -MSD		
NOTES:					



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-03</b>		<b>NORTHING:</b>	<b>EASTING:</b>
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> <u>REACH 1</u> REACH 2 REACH 3	
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/16/09 <b>TIME:</b> 0930	<b>WATER DEPTH:</b>

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <u>Yes</u> No 12/9 snow/rain Air Temperature <u>~20</u> °F Other:
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<u>~50%</u> <del>10-20%</del>
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")		Muck-Mud	black, very fine organic (FPOM)	<u>2-3%</u>
Gravel	2-64 mm (0.1-2.5")				
Sand	0.06-2 mm (gritty)	<u>25</u>	Marl	grey, shell fragments	
Silt	0.004-0.06mm	<u>70</u>			
Clay	<0.004 mm (slick)	<u>25</u>			

<b>SEDIMENT CHARACTERIZATION</b>		<b>NEAR BOTTOM WATER QUALITY:</b>	
Substrate color: <u>DIARK BROWN/BLACK</u>		Temperature (°C): <u>14.67</u>	
Substrate consistency: <u>SILT w/ LARGE CPOM FIBERS</u>		(mg/L): <u>12.19</u> DO (% Sat): <u>94.9</u>	
Floc layer present: <u>YES ~2 CM</u>		pH: <u>7.01</u>	
Moisture conditions:		Conductivity (mS/cm): <u>0.168 SC: 0.215</u>	
Benthic fauna: <u>NONE OBSERVED</u>		ORP (mV): <u>+55.6</u>	
<b>Odors</b> Normal _____ Chemical _____ Other _____ <b>Oils</b> <u>Absent</u> Slight Moderate Profuse		Sewage _____ Anaerobic (H <sub>2</sub> S) <u>SLIGHT</u> Petroleum _____ None _____	

<b>SEDIMENT ANALYSES</b>		<b>QA/QC:</b>	
<b>Parameter</b>	<b>0-0.5'</b>	Duplicate Sample Station? (Y / N)	
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR- -DUP	
AVS/SEM	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y / N)	
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- -MS	
		POM-E-WR- -MSD	

**NOTES:** RB LB

Flow

DEAD FALL

REP  
SILT  
CPOM

\* WE03

FINE-MED SAND w/ SILT





SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-04</b>		<b>NORTHING:</b>	<b>EASTING:</b>		
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> REACH 1 REACH 2 REACH 3			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/16/09 <b>TIME:</b> 1020	<b>WATER DEPTH:</b> 1.0		
<b>WEATHER CONDITIONS</b>	Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? Yes No 12/9 snow/rain Air Temperature ~25°F Other:		
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)		<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	TRACE
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Gravel	2-64 mm (0.1-2.5")				
Sand	0.06-2 mm (gritty)	55	Marl	grey, shell fragments	
Silt	0.004-0.06mm	85			
Clay	<0.004 mm (slick)	10			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: DARK BROWN			Temperature (°C): 4.69		
Substrate consistency: SILT			DO (mg/L): 11.16 DO (% Sat): 93.2		
Floc layer present:			pH: 6.99		
Moisture conditions:			Conductivity (mS/cm): 0.171 SC: 0.282		
Benthic fauna: NONE OBSERVED			ORP (mV): +28.6		
<b>Odors</b> Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other SLIGHT					
<b>Oils</b> Absent Slight Moderate Profuse					
<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>		
Parameter	0-0.5'		Duplicate Sample Station? (Y/N)		
THg + Metals	<input checked="" type="checkbox"/>		POM-E-WR- -DUP		
AVS/SEM	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N)		
Grain Size/TOC	<input checked="" type="checkbox"/>		POM-E-WR-04 -MS		
			POM-E-WR-04 -MSD		
			NO MS/MSD FOR GS		
<b>NOTES:</b> RB LB FIVE DEP-SUR/CUT 1.26 EMBEDDED LOWEN/CORRE					



<b>SAMPLE IDENTIFICATION:</b> <div style="font-size: 1.2em; font-weight: bold;">POM-E-WR-05</div>			<b>NORTHING:</b>		<b>EASTING:</b>	
<b>INVESTIGATORS:</b> Long      Collins			<b>RIVER REACH:</b> REACH 1      REACH 2      REACH 3			
<b>FORM COMPLETED BY:</b> Long      Collins			<b>DATE:</b> 12/16/09 <b>TIME:</b> 11 <sup>00</sup>		<b>WATER DEPTH:</b> 0.9	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	(Yes / No) 12/9 sunny
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature ~25 °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other:
	<input checked="" type="checkbox"/>	<input type="checkbox"/> partly cloudy	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood,	~10%
Boulder	> 256 mm (10")			coarse plant materials (CPOM)	
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Sand	0.06-2 mm (gritty)	20	Marl	grey,	
Silt	0.004-0.06mm	70		shell fragments	
Clay	<0.004 mm (slick)	10			

<b>SEDIMENT CHARACTERIZATION</b> Substrate color: DARK BROWN Substrate consistency: SILTY W/ FINE SAND Floc layer present: YES ~ 1 CM Moisture conditions: Benthic fauna: AMPHIPOD @ SAMPLE LOCATION	<b>NEAR BOTTOM WATER QUALITY:</b> Temperature (°C): 4.75 DO (mg/L): 12.02      DO (% Sat): 93.4 pH: 7.07 Conductivity (mS/cm): 0.171      EC: 0.280 ORP (mV): -26.1
---	--

<b>Odors</b> <input checked="" type="radio"/> Normal      Sewage      Petroleum <input type="radio"/> Chemical      Anaerobic (H <sub>2</sub> S)      None Other _____ <b>Oils</b> <input checked="" type="radio"/> Absent      Slight      Moderate      Profuse	
--	--

<b>SEDIMENT ANALYSES</b> <table style="width: 100%;"> <tr> <th style="width: 70%;">Parameter</th> <th style="width: 30%;">0-0.5'</th> </tr> <tr> <td>THg + Metals</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>AVS/SEM</td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Grain Size/TOC</td> <td><input checked="" type="checkbox"/></td> </tr> </table>	Parameter	0-0.5'	THg + Metals	<input checked="" type="checkbox"/>	AVS/SEM	<input checked="" type="checkbox"/>	Grain Size/TOC	<input checked="" type="checkbox"/>	<b>QA/QC:</b> Duplicate Sample Station? ( Y / N ) POM-E-WR-      -DUP  MS/MSD Sample Station? ( Y / N ) POM-E-WR-      -MS POM-E-WR-      -MSD
Parameter	0-0.5'								
THg + Metals	<input checked="" type="checkbox"/>								
AVS/SEM	<input checked="" type="checkbox"/>								
Grain Size/TOC	<input checked="" type="checkbox"/>								

**NOTES:**





SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-06</b>		<b>NORTHING:</b>	<b>EASTING:</b>		
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> REACH 1 REACH 2 REACH 3			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/16/09 <b>TIME:</b> 1125	<b>WATER DEPTH:</b> 3.2'		
<b>WEATHER CONDITIONS</b>	Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? Yes/No <u>SNOW/RAIN</u> Air Temperature <u>25</u> °F Other:		
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)		<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock		TOP BOTTOM	Detritus	sticks, wood, coarse plant materials (CPOM)	TRACE
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Sand	0.06-2 mm (gritty)	25			
Silt	0.004-0.06mm	70 40	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	25 60			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: SEE NOTES BELOW			Temperature (°C): 5.36		
Substrate consistency:			DO (mg/L): 11.79 DO (% Sat): 93.4		
Floc layer present: 1-2 mm			pH: 7.25		
Moisture conditions: LOOSE & SURFACE DEWETTED			Conductivity (mS/cm): 0.193; 0.309		
Benthic fauna: NONE OBSERVED BELOW			ORP (mV): 224.2 + 466.1		
<b>Odors</b> Normal: Sewage Chemical: Anaerobic (H <sub>2</sub> S) Other: _____ <b>Oils</b> Absent Slight Moderate Profuse					
<b>SEDIMENT ANALYSES</b>					
Parameter	0-0.5'				
THg + Metals	<input checked="" type="checkbox"/>				
AVS/SEM	<input checked="" type="checkbox"/>				
Grain Size/TOC	<input checked="" type="checkbox"/>				
		<b>QA/QC:</b> Duplicate Sample Station? (Y/N) POM-E-WR-06 -DUP MS/MSD Sample Station? (Y/N) POM-E-WR- -MS POM-E-WR- -MSD			
<b>NOTES:</b>					
TOP 1-2" SILTS w/ SOME FINE SAND DARK BROWN					
2-6" SILT/CLAY: DARK GRAY w SOME BLACK STREAKING					
NOTE DUP BOTTLE FOR METALS HAD CRACKED LID; FILLED UNUSED					
MSD JAR FOR METALS/TOC ANALYSES; WILL NOTE ON CLMN					



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-01</b>		<b>NORTHING:</b>	<b>EASTING:</b>		
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> <b>REACH 1</b> REACH 2 REACH 3			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/16/09 <b>TIME:</b> 12:07	<b>WATER DEPTH:</b>		
<b>WEATHER CONDITIONS</b>	Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? Yes No 12/9 snow/rain Air Temperature ~25-30 °F Other:		
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)		<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	~20%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2
Sand	0.06-2 mm (gritty)	10			
Silt	0.004-0.06mm	80	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	10			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: DARK BROWN			Temperature (°C): 5.13		
Substrate consistency: SANDY SILT (FINE-MED SAND)			DO (mg/L): 12.29 DO (% Sat): 96.5		
Floc layer present: 1-2 MM			pH: 7.18		
Moisture conditions: UPPER LAYER LOOSE			Conductivity (mS/cm): 0.180 SC: 0.289		
Benthic fauna: AMPHIPOD, CHIRONOMUS			ORP (mV): 82.4		
<b>Odors</b> Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other SLIGHT					
<b>Oils</b> Absent Slight Moderate Profuse					
<b>SEDIMENT ANALYSES</b>					
Parameter	0-0.5'				
THg + Metals	<input checked="" type="checkbox"/>	<b>QA/QC:</b>			
AVS/SEM	<input checked="" type="checkbox"/>	Duplicate Sample Station? (Y/N) <b>(N)</b>			
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- -DUP			
		MS/MSD Sample Station? (Y/N) <b>(N)</b>			
		POM-E-WR- -MS			
		POM-E-WR- -MSD			
<b>NOTES:</b>					
COULD NOT GET SET GPS POINT; SAMPLE LOCATED APPROX 10' DWS OF ISLAND ALONG SAME PERP. TRANSECT AS SW GPS POINT					



**SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

<b>SAMPLE IDENTIFICATION:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">POM-E-WR-08</div>			<b>NORTHING:</b>		<b>EASTING:</b>	
<b>INVESTIGATORS:</b> (Long Collins)			<b>RIVER REACH:</b> REACH 1      REACH 2      REACH 3			
<b>FORM COMPLETED BY:</b> (Long Collins)			<b>DATE:</b> 12/16/09 <b>TIME:</b> 1235		<b>WATER DEPTH:</b> 1.1'	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/>	Yes/No
	<input type="checkbox"/>	<input type="checkbox"/>	Air Temperature ~30 °F
	<input type="checkbox"/>	<input type="checkbox"/>	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	12/9 snow
			storm rain showers partly cloudy clear/sunny

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	< 5%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Gravel	2-64 mm (0.1-2.5")				
Sand	0.06-2 mm (gritty)	TRACE	Marl	grey, shell fragments	
Silt	0.004-0.06mm	60			
Clay	<0.004 mm (slick)	40			

<b>SEDIMENT CHARACTERIZATION</b>	<b>NEAR BOTTOM WATER QUALITY:</b>
Substrate color: DARK BROWN / GRAY	Temperature (°C): 5.24
Substrate consistency: SILT w/ HIGH CLAY CONTENT	DO (mg/L): 12.33      DO (% Sat): 97.3
Floc layer present: 2-3 mm	pH: 7.17
Moisture conditions: LOOSE @ SURFACE; MORE CONSOLIDATED BELOW	Conductivity (mS/cm): 0.180 ; SC: 0.284
Benthic fauna: NONE OBSERVED	ORP (mV): -22.0

<b>Odors</b>			
Normal	Sewage	Petroleum	
Chemical	Anaerobic (H <sub>2</sub> S)	None	
Other _____			
<b>Oils</b>			
Absent	Slight	Moderate	Profuse

<b>SEDIMENT ANALYSES</b>		<b>QA/QC:</b>	
<b>Parameter</b>	<b>0-0.5'</b>	Duplicate Sample Station? ( Y / <u>N</u> )	
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR-	-DUP
AVS/SEM	<input checked="" type="checkbox"/>		
Grain Size/TOC	<input checked="" type="checkbox"/>	MS/MSD Sample Station? ( Y / <u>N</u> )	
		POM-E-WR-	-MS
		POM-E-WR-	-MSD

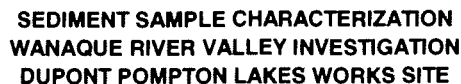
**NOTES:**



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-09</b>		<b>NORTHING:</b>	<b>EASTING:</b>		
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> REACH 1 <b>REACH 2</b> REACH 3			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/16/09 <b>TIME:</b> 1300	<b>WATER DEPTH:</b> 0.9'		
<b>WEATHER CONDITIONS</b>	Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes / No Air Temperature ~ 30 °F Other:		
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)		<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	~ 10%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Gravel	2-64 mm (0.1-2.5")				
Sand	0.06-2 mm (gritty)	TRACE	Marl	grey, shell fragments	
Silt	0.004-0.06mm	95%			
Clay	<0.004 mm (slick)	5%			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: DARK BROWN			Temperature (°C): 5.17		
Substrate consistency: SILT w/ TRACE FINE SAND			DO (mg/L): 11.32 DO (% Sat): 88.0		
Floc layer present: 1-2 mm			pH: 6.97		
Moisture conditions: WISE @ SURFACE			Conductivity (mS/cm): 0.179 SC: 0.308		
Benthic fauna: NONE OBSERVED			ORP (mV): +36.3		
<b>Odors</b> Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) SLIGHT None Other					
<b>Oils</b> Absent Slight Moderate Profuse					
<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>		
Parameter	0-0.5'		Duplicate Sample Station? (Y/N)		
THg + Metals	<input checked="" type="checkbox"/>		POM-E-WR- -DUP		
AVS/SEM	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N)		
Grain Size/TOC	<input checked="" type="checkbox"/>		POM-E-WR- -MS		
			POM-E-WR- -MSD		
<b>NOTES:</b>					
COULD NOT GET GPS RECEPTION; WILL USE PELCON GPS POINT					
CORROGATED METAL PIPE ~ 8' DIAMETER IN RIVER ALONG RIB					
~ 400' UPS OF STATION					





SAMPLE IDENTIFICATION: <b>POM-E-WR-10</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: REACH 1 <b>REACH 2</b> REACH 3	
FORM COMPLETED BY: Long Collins		DATE: 12/16/09 TIME: 1320	WATER DEPTH: 1.4'
WEATHER CONDITIONS		Now Past 24 hours Has there been a heavy rain in the last 7 days? <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny Yes No 12/9 Sun Air Temperature 23-35 °F Other:	
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)		ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)	
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type Characteristic Approximate % Composition in Sample
Bedrock			Detritus sticks, wood, coarse plant materials (CPOM) 10-20%
Boulder	> 256 mm (10")		Muck-Mud black, very fine organic (FPOM) 1-2%
Cobble	64-256 mm (2.5-10")		Marl grey, shell fragments
Gravel	2-64 mm (0.1-2.5")	10% fine	
Sand	0.06-2 mm (gritty)	80	
Silt	0.004-0.06mm	10	
Clay	<0.004 mm (slick)		
SEDIMENT CHARACTERIZATION		NEAR BOTTOM WATER QUALITY:	
Substrate color: DARK BROWN / GRAY		Temperature (°C): 5.03	
Substrate consistency: LOOSE SILTS w/ FINE SAND CPOM		DO (mg/L): 12.06 DO (% Sat): 94.6	
Floc layer present: THICK 1-2 cm CPOM		pH: 7.05	
Moisture conditions: LOOSE		Conductivity (mS/cm): 0.204 SC: 0.327	
Benthic fauna: CHIRONOMUS		ORP (mV): 18.4	
Odors Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other _____			
Oils Absent Slight Moderate Profuse			
SEDIMENT ANALYSES		QA/QC:	
Parameter	0-0.5'	Duplicate Sample Station? ( Y / N ) POM-E-WR- -DUP	
THg + Metals	<input checked="" type="checkbox"/>	MS/MSD Sample Station? ( Y / N ) POM-E-WR- -MS POM-E-WR- -MSD	
AVS/SEM	<input checked="" type="checkbox"/>		
Grain Size/TOC	<input checked="" type="checkbox"/>		
NOTES:			



SAMPLE IDENTIFICATION: <b>POM-E-WR- 11</b>		NORTHING:		EASTING:	
INVESTIGATORS: Long Collins		RIVER REACH: REACH 1 <b>REACH 2</b> REACH 3			
FORM COMPLETED BY: Long Collins		DATE: 12/14/09 TIME: 16451345		WATER DEPTH: 1.2'	
WEATHER CONDITIONS		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny			
Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny		Has there been a heavy rain in the last 7 days? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 12/9 snow			
Air Temperature ~ 35 °F		Other:			
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5-10%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")	few			
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Sand	0.06-2 mm (gritty)	20 MED-FINE			
Silt	0.004-0.06mm	70	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	10			
SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:		
Substrate color: DARK BROWN			Temperature (°C): 5.17		
Substrate consistency: SANDY SILT			DO (mg/L): 12.33 DO (% Sat): 97.3		
Floc layer present: MINIMAL 1-2 mm			pH: 7.23		
Moisture conditions: MINIMAL WATER IN SAMPLE			Conductivity (mS/cm): 0.191; sc: 0.293		
Benthic fauna: CORALICULA; AMPHIPODA			ORP (mV): -1.4		
Odors <input checked="" type="checkbox"/> Normal Chemical Other			Sewage Anaerobic (H <sub>2</sub> S) None		
Oils <input checked="" type="checkbox"/> Absent			Slight Moderate Profuse		
SEDIMENT ANALYSES			QA/QC:		
Parameter	0-0.5'	Duplicate Sample Station? (Y <input checked="" type="checkbox"/> )			
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR- -DUP			
AVS/SEM	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y <input checked="" type="checkbox"/> )			
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- -MS			
		POM-E-WR- -MSD			
NOTES:					



<b>SAMPLE IDENTIFICATION:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">POM-E-WR- 12</div>			<b>NORTHING:</b>		<b>EASTING:</b>	
<b>INVESTIGATORS:</b> Long Collins			<b>RIVER REACH:</b> REACH 1 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">REACH 2</span> REACH 3			
<b>FORM COMPLETED BY:</b> Long Collins			<b>DATE:</b> 12/14/09 <b>TIME:</b> 1415		<b>WATER DEPTH:</b> 1.4'	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <div style="text-align: right;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Yes</span> No 12/9 snow         </div>
	<input type="checkbox"/>	<input type="checkbox"/>	storm
	<input type="checkbox"/>	<input type="checkbox"/>	rain
	<input type="checkbox"/>	<input type="checkbox"/>	showers
	<input type="checkbox"/>	<input type="checkbox"/>	partly cloudy
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	clear/sunny
Air Temperature <span style="font-size: 1.2em;">235</span> °F			Other:

INORGANIC SUBSTRATE COMPONENTS			ORGANIC SUBSTRATE COMPONENTS		
(should add up to 100%)			(does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	~10%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Sand	0.06-2 mm (gritty)	10			
Silt	0.004-0.06mm	60	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	30			

SEDIMENT CHARACTERIZATION	NEAR BOTTOM WATER QUALITY:
Substrate color: <span style="font-size: 1.2em;">DARK BROWN</span>	Temperature (°C): <span style="font-size: 1.2em;">5.18</span>
Substrate consistency: <span style="font-size: 1.2em;">SANDY SILT (FINE SAND)</span>	DO (mg/L): <span style="font-size: 1.2em;">92.42</span> DO (% Sat): <span style="font-size: 1.2em;">97.0%</span>
Floc layer present: <span style="font-size: 1.2em;">1-2 mm</span>	pH: <span style="font-size: 1.2em;">7.27</span>
Moisture conditions: <span style="font-size: 1.2em;">LOSE @ SURFACE; LESS WATER DEEPER</span>	Conductivity (mS/cm): <span style="font-size: 1.2em;">0.179</span> ; SC: <span style="font-size: 1.2em;">0.289</span>
Benthic fauna: <span style="font-size: 1.2em;">AMPHIPOD;</span>	ORP (mV): <span style="font-size: 1.2em;">+ 39.9</span>
<b>Odors</b> Normal _____ Chemical <span style="margin-left: 100px;">Sewage</span> <span style="margin-left: 100px;">Petroleum</span> <div style="display: flex; justify-content: space-around;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Anaerobic (H<sub>2</sub>S)</span> <span>SLIGHT</span> <span>None</span> </div> Other _____ <b>Oils</b> <div style="display: flex; justify-content: space-between;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Absent</span> <span>Slight</span> <span>Moderate</span> <span>Profuse</span> </div>	

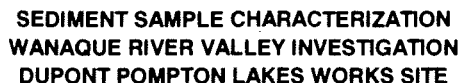
  

SEDIMENT ANALYSES		QA/QC:
Parameter	0-0.5'	Duplicate Sample Station? ( Y / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span> )
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR- -DUP
AVS/SEM	<input checked="" type="checkbox"/>	
Grain Size/TOC	<input checked="" type="checkbox"/>	MS/MSD Sample Station? ( Y / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span> )
		POM-E-WR- -MS
		POM-E-WR- -MSD

**NOTES:**





<b>SAMPLE IDENTIFICATION:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">POM-E-WR-13</div>			<b>NORTHING:</b>		<b>EASTING:</b>	
<b>INVESTIGATORS:</b> Long Collins			<b>RIVER REACH:</b> REACH 1 <u>REACH 2</u> REACH 3			
<b>FORM COMPLETED BY:</b> Long Collins			<b>DATE:</b> 12/18/09 <b>TIME:</b> 1200		<b>WATER DEPTH:</b> 0.6	
<b>WEATHER CONDITIONS</b>		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny			
		Has there been a heavy rain in the last 7 days? Yes / <u>No</u> Air Temperature <u>25</u> °F Other:				
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)			<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample	
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	100%	
Boulder	> 256 mm (10")					
Cobble	64-256 mm (2.5-10")					
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	2-3%	
Sand	0.06-2 mm (gritty)	5-10% fine sand				
Silt	0.004-0.06mm	80%	Marl	grey, shell fragments		
Clay	<0.004 mm (slick)	10				
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>			
Substrate color: <u>dark brown</u>			Temperature (°C): <u>2.89</u>			
Substrate consistency: <u>fine sandy silt</u>			DO (mg/L): <u>11.90</u> DO (% Sat): <u>88.3</u>			
Floc layer present: <u>2-3mm</u>			pH: <u>7.27</u>			
Moisture conditions: <u>saturated; loose</u>			Conductivity (mS/cm): <u>0.176</u> <u>SE: 0.304</u>			
Benthic fauna: <u>water snail, amphipod</u>			ORP (mV): <u>+33.7</u>			
<b>Odors</b> Normal      Sewage      Petroleum Chemical      Anaerobic (H <sub>2</sub> S) <u>None</u> Other:						
<b>Oils</b> <u>Absent</u> Slight      Moderate      Profuse						
<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>			
Parameter	0-0.5'		Duplicate Sample Station? (Y/N) <u>N</u>			
THg + Metals	<input checked="" type="checkbox"/>		POM-E-WR-      -DUP			
AVS/SEM	<input checked="" type="checkbox"/>					
Grain Size/TOC	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N) <u>N</u>			
			POM-E-WR-      -MS			
			POM-E-WR-      -MSD			
<b>NOTES:</b> <u>thin redox layer @ surface 1-2M</u>						

**SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

<b>SAMPLE IDENTIFICATION:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">POM-E-WR- <span style="font-size: 1.5em;">14</span></div>		<b>NORTHING:</b>		<b>EASTING:</b>	
<b>INVESTIGATORS:</b> Long <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Collins</span>		<b>RIVER REACH:</b> REACH 1 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">REACH 2</span> REACH 3			
<b>FORM COMPLETED BY:</b> Long <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Collins</span>		<b>DATE:</b> 12/12/09 <b>TIME:</b> 1530		<b>WATER DEPTH:</b> 0.8'	
<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">No</span>		
	<input type="checkbox"/>	<input type="checkbox"/> storm			
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature ~ 30 °F		
	<input type="checkbox"/>	<input type="checkbox"/> showers			
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:		
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny			
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)			<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood,	10-20
Boulder	> 256 mm (10")			coarse plant materials (CPOM)	
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2
Sand	0.06-2 mm (gritty)	10 (FINE)			
Silt	0.004-0.06mm	70	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	20			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: <span style="font-size: 1.2em;">DARK BROWN</span>			Temperature (°C): <span style="font-size: 1.2em;">3-3.3</span>		
Substrate consistency: <span style="font-size: 1.2em;">FINE SAND SILT w/ CPOM</span>			DO (mg/L): <span style="font-size: 1.2em;">12.75</span> DO (% Sat): <span style="font-size: 1.2em;">95.5</span>		
Floc layer present:			pH: <span style="font-size: 1.2em;">--</span>		
Moisture conditions:			Conductivity (mS/cm): <span style="font-size: 1.2em;">0.166</span> SC: <span style="font-size: 1.2em;">0.283</span>		
Benthic fauna:			ORP (mV): <span style="font-size: 1.2em;">- 8.9</span>		
<b>Odors</b> Normal Chemical <span style="margin-left: 20px;"><span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Sewage</span></span> Other <span style="margin-left: 20px;"><span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Anaerobic (H<sub>2</sub>S)</span></span> <span style="margin-left: 100px;"><span style="font-size: 1.2em;">SLIGHT</span></span> <b>Oils</b> Absent      Slight      Moderate      Profuse			Petroleum None		
<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>		
Parameter	0-0.5'	Duplicate Sample Station? ( Y / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span> ) <div style="text-align: center; font-size: 1.2em;">POM-E-WR-                      -DUP</div> MS/MSD Sample Station? ( Y / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span> ) <div style="text-align: center; font-size: 1.2em;">POM-E-WR-                      -MS POM-E-WR-                      -MSD</div>			
THg + Metals	<input checked="" type="checkbox"/>				
AVS/SEM	<input checked="" type="checkbox"/>				
Grain Size/TOC	<input checked="" type="checkbox"/>				
<b>NOTES:</b>					

**SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-E-WR-15</b>			NORTHING:	EASTING:	
INVESTIGATORS: Long Collins			RIVER REACH: REACH 1 REACH 2 REACH 3		
FORM COMPLETED BY: Long Collins			DATE: 12/17/09 TIME: 1500	WATER DEPTH: 2.1'	
WEATHER CONDITIONS		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>		
Has there been a heavy rain in the last 7 days? Yes / NO Air Temperature ~30°F Other:					
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<5
Boulder	> 256 mm (10")		Muck-Mud	black, very fine organic (FPOM)	1-2
Cobble	64-256 mm (2.5-10")		Marl	grey, shell fragments	
Gravel	2-64 mm (0.1-2.5")				
Sand	0.06-2 mm (gritty)	~10 FINE			
Silt	0.004-0.06mm	70			
Clay	<0.004 mm (slick)	20			
SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:		
Substrate color: DARK BROWN			Temperature (°C): 3.78		
Substrate consistency: FINE SANDY SILT			DO (mg/L): 12.91 DO (% Sat): 97.9		
Floc layer present: 1-2 mm			pH: 7.29		
Moisture conditions: LOOSE			Conductivity (mS/cm): 0.175 SC: 0.291		
Benthic fauna: CHIRONOMID			ORP (mV): +22.1		
Odors Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other SLIGHT					
Oils Absent Slight Moderate Profuse					
SEDIMENT ANALYSES			QA/QC:		
Parameter	0-0.5'		Duplicate Sample Station? ( Y / N )		
THg + Metals	<input checked="" type="checkbox"/>		POM-E-WR- -DUP		
AVS/SEM	<input checked="" type="checkbox"/>		MS/MSD Sample Station? ( Y / N )		
Grain Size/TOC	<input checked="" type="checkbox"/>		POM-E-WR- -MS		
			POM-E-WR- -MSD		
NOTES:					





<b>SAMPLE IDENTIFICATION:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">POM-E-WR-16</div>		<b>NORTHING:</b>		<b>EASTING:</b>	
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> REACH 1 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">REACH 2</span> REACH 3			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/17/09 <b>TIME:</b> 1430		<b>WATER DEPTH:</b> 1.0	
<b>WEATHER CONDITIONS</b>		Now      Past 24 hours		Has there been a heavy rain in the last 7 days? Yes / <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">No</span>	
		<div style="display: flex; justify-content: space-around;"><div><input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny</div><div><input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny</div></div>			
		Air Temperature <span style="font-size: 1.2em;">~30</span> °F		Other:	
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)				<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)	
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	< 10%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2%
Sand	0.06-2 mm (gritty)	< 5 FINE			
Silt	0.004-0.06mm	80	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	15			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: <span style="font-size: 1.2em;">DARK BROWN</span>			Temperature (°C): <span style="font-size: 1.2em;">3.73</span>		
Substrate consistency:			DO (mg/L): <span style="font-size: 1.2em;">13.46</span> DO (% Sat): <span style="font-size: 1.2em;">102.0</span>		
Floc layer present: <span style="font-size: 1.2em;">1-2 MM</span>			pH: <span style="font-size: 1.2em;">7.24</span>		
Moisture conditions: <span style="font-size: 1.2em;">LOOSE</span>			Conductivity (mS/cm): <span style="font-size: 1.2em;">0.174</span> SC: <span style="font-size: 1.2em;">0.292</span>		
Benthic fauna: <span style="font-size: 1.2em;">AMPHIPODA ; CHIRONOMUS</span>			ORP (mV): <span style="font-size: 1.2em;">+12.4</span>		
<b>Odors</b> Normal      Sewage      Petroleum Chemical <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Anaerobic (H<sub>2</sub>S)</span> None Other: <span style="font-size: 1.2em;">SLIGHT</span>					
<b>Oils</b> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Absent</span> Slight      Moderate      Profuse					
<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>		
Parameter	0-0.5'	<div style="display: flex; justify-content: space-between;"><div>Duplicate Sample Station? (Y <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span>)</div><div>POM-E-WR-      -DUP</div></div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"><div>MS/MSD Sample Station? (Y <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">N</span>)</div><div>POM-E-WR-      -MS POM-E-WR-      -MSD</div></div>			
THg + Metals	<input checked="" type="checkbox"/>				
AVS/SEM	<input checked="" type="checkbox"/>				
Grain Size/TOC	<input checked="" type="checkbox"/>				
<b>NOTES:</b>					



<b>SAMPLE IDENTIFICATION:</b> <div style="text-align: center; font-size: 1.2em; font-weight: bold;">POM-E-WR-17-(0-0.5)</div>			<b>NORTHING:</b>		<b>EASTING:</b>																		
<b>INVESTIGATORS:</b> Long Collins			<b>RIVER REACH:</b> REACH 1 <u>REACH 2</u> REACH 3		<b>DATE:</b> 12/17/09 <b>TIME:</b> 14:00																		
<b>FORM COMPLETED BY:</b> Long Collins			<b>WATER DEPTH:</b> 1.1		<b>WEATHER CONDITIONS</b>																		
<table border="0" style="width:100%;"> <tr> <td style="width: 30%;">Now</td> <td style="width: 30%;">Past 24 hours</td> <td style="width: 40%;"></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>storm</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>rain</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>showers</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>partly cloudy</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>clear/sunny</td> </tr> </table>			Now	Past 24 hours		<input type="checkbox"/>	<input type="checkbox"/>	storm	<input type="checkbox"/>	<input type="checkbox"/>	rain	<input type="checkbox"/>	<input type="checkbox"/>	showers	<input type="checkbox"/>	<input type="checkbox"/>	partly cloudy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	clear/sunny	Has there been a heavy rain in the last 7 days? Yes <u>No</u>		
Now	Past 24 hours																						
<input type="checkbox"/>	<input type="checkbox"/>	storm																					
<input type="checkbox"/>	<input type="checkbox"/>	rain																					
<input type="checkbox"/>	<input type="checkbox"/>	showers																					
<input type="checkbox"/>	<input type="checkbox"/>	partly cloudy																					
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	clear/sunny																					
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%) <u>sandy silt</u>			<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)																				
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample																		
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	trace.																		
Boulder	> 256 mm (10")																						
Cobble	64-256 mm (2.5-10")																						
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2 %																		
Sand	0.06-2 mm (gritty)	40																					
Silt	0.004-0.06mm	60	Marl	grey, shell fragments																			
Clay	<0.004 mm (slick)																						

<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>											
Substrate color: <u>dark brown</u>			Temperature (°C): <u>4.34</u>											
Substrate consistency: <u>loose</u>			DO (mg/L): <u>13.15</u> DO (% Sat): <u>101.4</u>											
Floc layer present:			pH: <u>7.26</u>											
Moisture conditions: <u>moist (saturated)</u>			Conductivity (mS/cm): <u>0.175</u> <u>0.289 se</u>											
Benthic fauna: <u>Chironomids</u>			ORP (mV): <u>+48.9</u>											
<b>Odors</b> <table border="0" style="width:100%;"> <tr> <td style="width: 33%;">Normal</td> <td style="width: 33%;">Sewage</td> <td style="width: 33%;">Petroleum</td> </tr> <tr> <td>Chemical</td> <td>Anaerobic (H<sub>2</sub>S)</td> <td>None</td> </tr> <tr> <td colspan="3">Other _____</td> </tr> </table>			Normal	Sewage	Petroleum	Chemical	Anaerobic (H <sub>2</sub> S)	None	Other _____					
Normal	Sewage	Petroleum												
Chemical	Anaerobic (H <sub>2</sub> S)	None												
Other _____														
<b>Oils</b> Absent Slight Moderate Profuse														

<b>SEDIMENT ANALYSES</b>		<b>QA/QC:</b>	
Parameter	0-0.5'		
THg + Metals	<input checked="" type="checkbox"/>	Duplicate Sample Station? (Y <u>NT</u> )	
AVS/SEM	<input checked="" type="checkbox"/>	POM-E-WR- -DUP	
Grain Size/TOC	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y <u>NT</u> )	
		POM-E-WR- -MS	
		POM-E-WR- -MSD	

**NOTES:**



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-78 (0-0.5)</b>		<b>NORTHING:</b>	<b>EASTING:</b>		
<b>INVESTIGATORS:</b> Long <u>Collins</u>		<b>RIVER REACH:</b> REACH 1 <u>REACH 2</u> REACH 3			
<b>FORM COMPLETED BY:</b> Long <u>Collins</u>		<b>DATE:</b> 12/17/09 <b>TIME:</b> 13:15	<b>WATER DEPTH:</b> 1.3'		
<b>WEATHER CONDITIONS</b>	Now <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? Yes / <u>NO</u> Air Temperature <u>34</u> °F Other:		
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)		<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<u>some CPOM</u>
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	
Sand	0.06-2 mm (gritty)	<u>5</u> Fine			
Silt	0.004-0.06mm	<u>65</u>	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	<u>30</u>			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: <u>dark brown / grey</u>			Temperature (°C): <u>4.05</u>		
Substrate consistency: <u>loose</u>			DO (mg/L): <u>13.34</u> DO (% Sat): <u>102.1</u>		
Floc layer present: <u>minimal</u>			pH: <u>7.25</u>		
Moisture conditions: <u>moist (saturated)</u>			Conductivity (mS/cm): <u>0.171</u> <u>0.286 SC</u>		
Benthic fauna: <u>Chironomids</u>			ORP (mV): <u>+28.2</u>		
<b>Odors</b> Normal <u>Sewage</u> Petroleum Chemical <u>Anaerobic (H<sub>2</sub>S)</u> None Other <u>Slight</u>					
<b>Oils</b> <u>Absent</u> Slight Moderate Profuse					
<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>		
Parameter	0-0.5'	Duplicate Sample Station? <u>(Y/N)</u>			
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR- <u>6-0.5</u> DUP			
AVS/SEM	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y/N)			
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- -MS			
		POM-E-WR- -MSD			
<b>NOTES:</b>					
<u>STRONG WIND BLOWING DOWN VALLEY; MAYBE MIXING STATION</u>					
<u>SW @ SAMPLING STATION</u>					





SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-19</b>			<b>NORTHING:</b>		<b>EASTING:</b>	
<b>INVESTIGATORS:</b> Long Collins			<b>RIVER REACH:</b> REACH 1 REACH 2 <b>REACH 3</b>			
<b>FORM COMPLETED BY:</b> Long Collins			<b>DATE:</b> 12/12/09 <b>TIME:</b> 0820		<b>WATER DEPTH:</b> 1.4	
<b>WEATHER CONDITIONS</b>		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny		Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny		Has there been a heavy rain in the last 7 days? Yes <input checked="" type="checkbox"/> No Air Temperature ~20°F Other:
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)			<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample	
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	< 10%	
Boulder	> 256 mm (10")					
Cobble	64-256 mm (2.5-10")					
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	1-2%	
Sand	0.06-2 mm (gritty)	25 FINE				
Silt	0.004-0.06mm	70	Marl	grey, shell fragments		
Clay	<0.004 mm (slick)	25				
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>			
Substrate color: DARK BROWN			Temperature (°C): 2.68			
Substrate consistency: SILT w/ FINE SAND			DO (mg/L): 12.97 DO (% Sat): 95.8			
Floc layer present: 1-2 cm			pH: 6.70			
Moisture conditions: LOOSE			Conductivity (mS/cm): 0.165 SC: 0.287			
Benthic fauna: AMPHIPODA			ORP (mV): +64.4			
<b>Odors</b> Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other						
<b>Oils</b> Absent Slight Moderate Profuse						
<b>SEDIMENT ANALYSES</b>						
Parameter	0-0.5'		<b>QA/QC:</b>			
THg + Metals	<input checked="" type="checkbox"/>		Duplicate Sample Station? (Y/N) <input checked="" type="checkbox"/>			
AVS/SEM	<input checked="" type="checkbox"/>		POM-E-WR- -DUP			
Grain Size/TOC	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N) <input checked="" type="checkbox"/>			
			POM-E-WR- -MS			
			POM-E-WR- -MSD			
<b>NOTES:</b>						
POM-E GRAB YIELDED APPX TOP 4" OF SED; SUBSTRATE BELOW IS MORE COMPACT AND WAS NOT SAMPLED BY THE GRAB						
DMS OF RIFFLE; DEF AREA ON RB						



SAMPLE IDENTIFICATION: <b>POM-E-WR-20</b>		NORTHING:		EASTING:	
INVESTIGATORS: Long Collins		RIVER REACH: REACH 1 REACH 2 REACH 3			
FORM COMPLETED BY: Long Collins		DATE: 12/12/09 TIME: 0845		WATER DEPTH: 1.2'	
WEATHER CONDITIONS		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny		Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	
		Has there been a heavy rain in the last 7 days? Yes / No			
		Air Temperature ~ 30 °F			
		Other:			
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	TRACE
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	~ 1%
Sand	0.06-2 mm (gritty)	60 (FINE-MED)			
Silt	0.004-0.06mm	35	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	5			
SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:		
Substrate color:			Temperature (°C): 2.63		
Substrate consistency: SILT SAND (FINE-MED)			DO (mg/L): 12.55 DO (% Sat): 92.1		
Floc layer present:			pH: 6.96		
Moisture conditions:			Conductivity (mS/cm): 0.172 SC: 0.298		
Benthic fauna: CHIRONOMUS			ORP (mV): +69.5		
Odors Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other					
Oils Absent Slight Moderate Profuse					
SEDIMENT ANALYSES			QA/QC:		
Parameter	0-0.5'	Duplicate Sample Station? (Y/N)			
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR- -DUP			
AVS/SEM	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y/N)			
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- -MS			
		POM-E-WR- -MSD			
NOTES:					
DET AREA ON RS DMS THIS ENTERING ON LB					



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-21</b>		<b>NORTHING:</b>	<b>EASTING:</b>		
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> REACH 1 REACH 2 <b>REACH 3</b>			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/12/09 <b>TIME:</b> 0915	<b>WATER DEPTH:</b> 0.5'		
<b>WEATHER CONDITIONS</b>	Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? Yes / <b>No</b> Air Temperature <b>~20</b> °F Other:		
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)		<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<b>10 - 20%</b>
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")		Muck-Mud	black, very fine organic (FPOM)	<b>1 - 2</b>
Gravel	2-64 mm (0.1-2.5")				
Sand	0.06-2 mm (gritty)	<b>10 FINE</b>	Marl	grey, shell fragments	
Silt	0.004-0.06mm	<b>70</b>			
Clay	<0.004 mm (slick)	<b>20</b>			
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: <b>PARK BROWN / BLACK</b>			Temperature (°C): <b>2.12</b>		
Substrate consistency: <b>SILT w/ SOME FINE SAND</b>			DO (mg/L): <b>10.53</b> DO (% Sat): <b>76.3</b>		
Floc layer present: <b>1-2 cm</b>			pH: <b>6.82</b>		
Moisture conditions: <b>LOOSE @ SURFACE</b>			Conductivity (mS/cm): <b>0.178</b> <b>SC 0.315</b>		
Benthic fauna: <b>150 PODA</b>			ORP (mV): <b>+10.8</b>		
<b>Odors</b> Normal Chemical Other <b>Sewage</b> <b>Anaerobic (H<sub>2</sub>S)</b> <b>SLIGHT</b> Petroleum None					
<b>Oils</b> <b>Absent</b> Slight Moderate Profuse					
<b>SEDIMENT ANALYSES</b>					
Parameter	0-0.5'				
THg + Metals	<input checked="" type="checkbox"/>	<b>QA/QC:</b>			
AVS/SEM	<input checked="" type="checkbox"/>	Duplicate Sample Station? (Y / <b>N</b> )			
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- -DUP			
		MS/MSD Sample Station? (Y / <b>N</b> )			
		POM-E-WR- -MS			
		POM-E-WR- -MSD			
<b>NOTES:</b>					
<b>SHALLOW SEDIMENTS DISTURBED BY BOAT AND SAMPLING; HQ MEASUREMENTS MAY REFLECT THIS DISTURBANCE</b>					





SEDIMENT SAMPLE CHARACTERIZATION  
WANAUKE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

SAMPLE IDENTIFICATION: <b>POM-E-WR-22</b>		NORTHING:	EASTING:
INVESTIGATORS: Long Collins		RIVER REACH: REACH 1 REACH 2 <b>REACH 3</b>	
FORM COMPLETED BY: Long Collins		DATE: <b>12/17/09</b> TIME: <b>0950</b>	WATER DEPTH: <b>3.8' 1.6'</b>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes / <b>No</b> Air Temperature <b>~20</b> °F Other:
	<input type="checkbox"/>	<input type="checkbox"/> storm	
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<b>~20%</b>
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	<b>2-3%</b>
Sand	0.06-2 mm (gritty)	<b>TRACE (FINE)</b>			
Silt	0.004-0.06mm	<b>70</b>	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	<b>70</b>			

SEDIMENT CHARACTERIZATION		NEAR BOTTOM WATER QUALITY:	
Substrate color: <b>DARK BROWN/BLACK</b>		Temperature (°C): <b>2.78</b>	
Substrate consistency: <b>SILT w/TRACE FINE SAND</b>		DO (mg/L): <b>12.09</b> DO (% Sat): <b>89.4</b>	
Floc layer present: <b>Yes 1-2 cm</b>		pH: <b>7.2</b>	
Moisture conditions: <b>LOOSE</b>		Conductivity (mS/cm): <b>0.179</b> <b>SC: 0.312</b>	
Benthic fauna: <b>C. ATRODONTUS</b>		ORP (mV): <b>+1.4</b>	
Odors			
Normal	Sewage	Petroleum	
Chemical	<b>Anaerobic (H<sub>2</sub>S)</b>	None	
Other			
Oils			
<b>Absent</b>	Slight	Moderate Profuse	

SEDIMENT ANALYSES		QA/QC:	
Parameter	0-0.5'	Duplicate Sample Station? (Y) <b>(N)</b>	
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR- -DUP	
AVS/SEM	<input checked="" type="checkbox"/>	MS/MSD Sample Station? <b>(Y)</b> / N	
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- <b>22</b> -MS	
		POM-E-WR- <b>22</b> -MSD	

NOTES:

**JOHN REDOX LAYER @ SURFACE 1-2 mm (BROWN)**

**REACH 3**

**REACH 2**

**REACH 1**

**CONCRETE**

**WE22-SW**

**EMERGENCY**

**WE22-SW**

**DEP AREA**

**SILT**

**WE22-SW**



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

SAMPLE IDENTIFICATION: <b>POM-E-WR-23</b>		NORTHING:	EASTING:
INVESTIGATORS: <u>Long</u> <u>Collins</u>		RIVER REACH: REACH 1 REACH 2 <u>REACH 3</u>	
FORM COMPLETED BY: <u>Long</u> <u>Collins</u>		DATE: <u>12/14/09</u> TIME: <u>1050</u>	WATER DEPTH: <u>1.1'</u>

WEATHER CONDITIONS	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes / <u>No</u> Air Temperature <u>~20-25</u> °F Other:
	<input type="checkbox"/>	<input type="checkbox"/> storm	
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	
<input type="checkbox"/>	<input type="checkbox"/> partly cloudy		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<u>TRACE</u>
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	<u>~1%</u>
Sand	0.06-2 mm (gritty)	<u>60 Percent Fine</u>			
Silt	0.004-0.06mm	<u>40</u>	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	<u>TRACE</u>			

SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:	
Substrate color: <u>Brown</u>			Temperature (°C): <u>2.75</u>	
Substrate consistency: <u>Fine-Med Sand w/ Silt</u>			DO (mg/L): <u>13.31</u> DO (% Sat): <u>98.4</u>	
Floc layer present: <u>None</u>			pH: <u>7.22</u>	
Moisture conditions: <u>Sediment had little water</u>			Conductivity (mS/cm): <u>0.177</u> <u>SC: 0.309</u>	
Benthic fauna: <u>None observed Chironomus</u>			ORP (mV): <u>+30.4</u>	
Odors <u>Normal</u> Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other _____				
Oils <u>Absent</u> Slight Moderate Profuse				

SEDIMENT ANALYSES		QA/QC:	
Parameter	0-0.5'	Duplicate Sample Station? (Y <u>N</u> )	
THg + Metals	<input checked="" type="checkbox"/>	POM-E-WR- -DUP	
AVS/SEM	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y <u>N</u> )	
Grain Size/TOC	<input checked="" type="checkbox"/>	POM-E-WR- -MS	
		POM-E-WR- -MSD	

NOTES:
<u>DEPOSITIONAL AREAS DIFFICULT TO LOCATE ALONG THIS REACH</u>
<u>DUE TO RIVER/RUN STRUCTURE</u>
<u>SUBSTRATE COARSER THAN OTHER LOCATION BUT IT WAS THE</u>
<u>LARGEST POCKET OF DEPOSITION FOUND IN REACH</u>



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-24</b>		<b>NORTHING:</b>	<b>EASTING:</b>		
<b>INVESTIGATORS:</b> Long Collins		<b>RIVER REACH:</b> REACH 1 REACH 2 <b>REACH 3</b>			
<b>FORM COMPLETED BY:</b> Long Collins		<b>DATE:</b> 12/17/09 <b>TIME:</b> 1110	<b>WATER DEPTH:</b> 2.1'		
<b>WEATHER CONDITIONS</b>	Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input checked="" type="checkbox"/> clear/sunny	Has there been a heavy rain in the last 7 days? Yes / <b>No</b> Air Temperature <b>25</b> °F Other:		
<b>INORGANIC SUBSTRATE COMPONENTS</b> (should add up to 100%)		<b>ORGANIC SUBSTRATE COMPONENTS</b> (does not necessarily add up to 100%)			
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	<b>30-40%</b>
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	<b>3-4%</b>
Sand	0.06-2 mm (gritty)	<b>TRACE</b>			
Silt	0.004-0.06mm		Marl	grey, shell fragments	
Clay	<0.004 mm (slick)				
<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: <b>TRACE BROWN / BLACK @ DEPTH</b>			Temperature (°C): <b>2.83</b>		
Substrate consistency: <b>SILT w/ HIGH CPOM / FPOM</b>			DO (mg/L): <b>13.44</b> DO (% Sat): <b>99.5</b>		
Floc layer present: <b>1-2 cm</b>			pH: <b>7.21</b>		
Moisture conditions: <b>LOOSE SILT</b>			Conductivity (mS/cm): <b>0.129</b> SC: <b>0.310</b>		
Benthic fauna: <b>AMPHIPOD, EGYPTIANA</b>			ORP (mV): <b>+38.0</b>		
<b>Odors</b> Normal <input type="checkbox"/> Sewage <input checked="" type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic (H <sub>2</sub> S) <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____					
<b>Oils</b> <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse					
<b>SEDIMENT ANALYSES</b>					
Parameter	0-0.5'	<b>QA/QC:</b>			
THg + Metals	<input checked="" type="checkbox"/>	Duplicate Sample Station? (Y/N) <b>N</b>			
AVS/SEM	<input checked="" type="checkbox"/>	POM-E-WR- <b>-DUP</b>			
Grain Size/TOC	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y/N) <b>N</b>			
		POM-E-WR- <b>-MS</b>			
		POM-E-WR- <b>-MSD</b>			
<b>NOTES:</b>					
SEDIMENTS DECLASSIFIED WHEN DISTURBED					
OXYDIZED LAYER @ SURFACE (BROWN) w/ BLACK ORGANIC SEDIMENTS BELOW					
ENTIRE AREA A DEPOSITIONAL ZONE FOR CPOM (LEAVES); HIGHLY ORGANIC SEDIMENTS					



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR- 01					
INVESTIGATORS:		RIVER REACH:			
Collins      Brightbill		Reach 1      Reach 2      Reach 3			
FORM COMPLETED BY:		DATE: 11/2/10		WATER DEPTH:	
Collins      Brightbill      SAW		TIME: 16:00		1.5'	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="checkbox"/> Yes / No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>45</u> °F
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> partly cloudy	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	12.47		
DO (mg/L):	8.58		Color: slightly stained
DO (% Saturation):	80.5		
pH:	6.99		Odor: no odor
Conductivity (mS/cm):	0.278		
ORP (mV):	189.9		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / ~~N~~ )

POM-W-WR-	-MS
POM-W-WR-	-MSD

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-</b> 10.5		NORTHING:	EASTING:
INVESTIGATORS: Collins      Brightbill		RIVER REACH: Reach 1 <u>Reach 2</u> Reach 3	
FORM COMPLETED BY: Collins      Brightbill      SAW		DATE: 11/3/10 TIME: 1545	WATER DEPTH: 1'

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>45</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other: _____
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	11.12		
DO (mg/L):	8.48		Color: clear
DO (% Saturation):	77.3		
pH:	7.40		Odor: NON
Conductivity (mS/cm):	0.315		
ORP (mV):	182.8		Other:

SURFACE WATER ANALYSES			
Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

Sample Depth (feet):

QA/QC:

Duplicate Sample Station? (Y N)

POM-W-WR- -DUP

MS/MSD Sample Station? (Y N)

POM-W-WR- 10.5 -MS/MSD

POM-W-WR- 10.5-035-MS/MSD

**NOTES:**

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**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR- 8 A-C					
INVESTIGATORS:		RIVER REACH:			
Collins	Brightbill	<del>Reach 1</del>		Reach 2	Reach 3
FORM COMPLETED BY:		DATE: 10/2/10		WATER DEPTH:	
Collins	Brightbill SW	TIME: 1430		1.5'	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes / <input type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>50</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other:
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	11.8		
DO (mg/L):	10.60		Color: clear
DO (% Saturation):	96.3		
pH:	6.97		Odor: No
Conductivity (mS/cm):	0.328		
ORP (mV):	123.9		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? (Y/N)

POM-W-WR- -MS

POM-W-WR- 08A -MSD

**NOTES:**



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR- 12					
INVESTIGATORS:		RIVER REACH:			
Collins	Brightbill	Reach 1		Reach 2	Reach 3
FORM COMPLETED BY:		DATE: 7/7/86		WATER DEPTH:	
Collins	Brightbill	TIME: 1515		1.5'	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="checkbox"/> Yes / No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>45</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	10.87		
DO (mg/L):	8.83		Color: clear
DO (% Saturation):	79.9		
pH:	7.50		Odor: NON
Conductivity (mS/cm):	0.309		
ORP (mV):	120.6		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? (Y/ N )

POM-W-WR-12 -DUP  
POM-W-WR-12-OIS-DUP

MS/MSD Sample Station? ( Y / ~~N~~ )

POM-W-WR- -MS  
POM-W-WR- -MSD

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-</b> 13.5		NORTHING:	EASTING:
INVESTIGATORS: Collins <del>Brightbill</del>		RIVER REACH: Reach 1 <u>Reach 2</u> Reach 3	
FORM COMPLETED BY: Collins    Brightbill <i>SAW</i>		DATE: 11/3/10 TIME: 1445	WATER DEPTH: 10"

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<u>Yes</u> / No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>50</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	10.87		
DO (mg/L):	9.15		Color: Clear
DO (% Saturation):	82.8		
pH:	7.60		Odor: Non
Conductivity (mS/cm):	0.299		
ORP (mV):	169.5		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / **N**)

POM-W-WR-	-MS
POM-W-WR-	-MSD

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR- 14					
INVESTIGATORS:		RIVER REACH:			
Collins	Brightbill	Reach 1		Reach 2	Reach 3
FORM COMPLETED BY:		DATE: 11/3/10		WATER DEPTH:	
Collins	Brightbill SAW	TIME: 1345		1'	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>50</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other: _____
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	10.95		
DO (mg/L):	9.36		Color: clear
DO (% Saturation):	84.8		
pH:	7.66		Odor: NON
Conductivity (mS/cm):	0.294		
ORP (mV):	90.5		Other:

SURFACE WATER ANALYSES			
Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

Sample Depth (feet):

QA/QC:

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR- -MS

POM-W-WR- -MSD

NOTES:



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-</b> 145		NORTHING:	EASTING:
INVESTIGATORS: Collins Brightbill		RIVER REACH: Reach 1 Reach 2 Reach 3	
FORM COMPLETED BY: Collins Brightbill SAW		DATE: 11/2/10 TIME: 1220	WATER DEPTH: 1'

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="checkbox"/> Yes / No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>50</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	Other: _____

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	L- 9.9 M- 10.34	R- 10.71	
DO (mg/L):	L- 9.35 M- 9.31	R- 8.7	Color: clear
DO (% Saturation):	L- 92.7 M- 93.3	R- 72.7	
pH:	L- 7.50 M- 7.54	R- 7.46	Odor: NON
Conductivity (mS/cm):	L- 0.295 M- 0.295	R- 93	
ORP (mV):	L- 136.3 M- 111.0	R- 142.5	Other:

SURFACE WATER ANALYSES			
Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input type="checkbox"/>	<input type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

Sample Depth (feet):

QA/QC:

Duplicate Sample Station? (Y/N) ☒ N

POM-W-WR- -DUP

MS/MSD Sample Station? ☒ Y

POM-W-WR- 14.5L-A -MS

POM-W-WR- -MSD

[illegible]

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-15</b>		NORTHING:	EASTING:
INVESTIGATORS: <u>Collins</u> <u>Brightbill</u>		RIVER REACH: Reach 1 <u>Reach 2</u> Reach 3	
FORM COMPLETED BY: Collins    Brightbill <i>SW</i>		DATE: 11/3/10 TIME: 1030	WATER DEPTH: 1.5'

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes / No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>42</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	L-8.49 M-8.96	R-9.48	
DO (mg/L):	L-8.13 M-8.80	R-8.74	Color: Clear
DO (% Saturation):	L-69.5 M-76.2	R-76.4	
pH:	L-7.37 M-7.42	R-7.48	Odor: None
Conductivity (mS/cm):	L-0.301 M-0.299	R-0.298	
ORP (mV):	L-109.5 M-132.2	R-138.4	Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input type="checkbox"/>	<input type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**QA/QC:**

Duplicate Sample Station? ( Y / **N** )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / **N** )

POM-W-WR- -MS

POM-W-WR- -MSD

**Sample Depth (feet):**

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-16</b>		NORTHING:	EASTING:
INVESTIGATORS: <u>Collins</u> <u>Brightbill</u>		RIVER REACH: Reach 1 <u>Reach 2</u> Reach 3	
FORM COMPLETED BY: Collins    Brightbill <i>SW</i>		DATE: <i>11/2/10</i> TIME: <i>1000</i>	WATER DEPTH: <i>10"</i>

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>40</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other:
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	<del>8.09</del> 8.08 <del>8.09</del>		
DO (mg/L):	<del>8.04</del> 8.04		Color: Clear
DO (% Saturation):	<del>68.1</del> 68.1		
pH:	<del>7.33</del> 7.33		Odor: NON
Conductivity (mS/cm):	<del>0.303</del> 0.303		
ORP (mV):	<del>88.2</del> 88.2		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? (Y/N) Y  
POM-W-WR- 16 -DUP

MS/MSD Sample Station? (Y N)

POM-W-WR-	-MS
POM-W-WR-	-MSD

**NOTES:**



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR- 17</b>		NORTHING:	EASTING:
INVESTIGATORS: Collins      Brightbill		RIVER REACH: Reach 1      Reach 2      Reach 3	
FORM COMPLETED BY: Collins      Brightbill      SW		DATE: 11/3/10 TIME: 9 <sup>15</sup>	WATER DEPTH: 1.5

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes / No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>38</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	7.88		
DO (mg/L):	7.45		Color: clear
DO (% Saturation):	63.5		
pH:	7.49		Odor: Non
Conductivity (mS/cm):	0.305		
ORP (mV):	156.8		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y (N)

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR- -MS

POM-W-WR- -MSD

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-18</b>		NORTHING:	EASTING:
INVESTIGATORS: <u>Collins</u> <u>Brightbill</u>		RIVER REACH: Reach 1 <u>Reach 2</u> Reach 3	
FORM COMPLETED BY: Collins    Brightbill <i>SAW</i>		DATE: <i>11/2/10</i> TIME: <i>8:45</i>	WATER DEPTH: <i>8"</i>

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes <input type="radio"/> No
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>30</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	7.92		
DO (mg/L):	0.38		Color: CLR
DO (% Saturation):	62.0		
pH:	7.24		Odor: NON
Conductivity (mS/cm):	0.38		
ORP (mV):	145.1		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y / ~~N~~ )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / **N** )

POM-W-WR-	-MS
POM-W-WR-	-MSD

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-19.5.ABC</b>		NORTHING:	EASTING:
INVESTIGATORS: Collins Brightbill		RIVER REACH: Reach 1 Reach 2 <b>Reach 3</b>	
FORM COMPLETED BY: Collins Brightbill		DATE: 11/4/10 TIME: 9:00	WATER DEPTH: 3.5

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / <u>No</u>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input checked="" type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>48</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	9.8	10.64	
DO (mg/L):	7.70.8%	9.2	Color: clear
DO (% Saturation):	9.00 8.0	81.8	
pH:	7.21	7.39	Odor: none
Conductivity (mS/cm):	0.343	0.240	
ORP (mV):	88 89.3	115/9	Other:
		↑ 11.5 D	

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? ( Y N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR- -MS

POM-W-WR- -MSD

**NOTES:**

Need to use 2 filters.

14145 - 19.5" D" TH<sub>2</sub>, TSS 1.25 - TH<sub>2</sub>



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: PB-W-01 <b>POM-W-WR-</b>	NORTHING:	EASTING:
INVESTIGATORS: Collins Brightbill	RIVER REACH: Reach 1      Reach 2      Reach 3	
FORM COMPLETED BY: Collins Brightbill	DATE: 11/4/10 TIME: 1030	WATER DEPTH: 11

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes / <u>No</u>
	<input type="checkbox"/>	<input type="checkbox"/> storm	
	<input checked="" type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>45</u> °F
	<input checked="" type="checkbox"/>	<input type="checkbox"/> showers	Other: _____
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	9.88		
DO (mg/L):	9.91		Color: clear
DO (% Saturation):	87.5		
pH:	7.52		Odor: none
Conductivity (mS/cm):	0.239		
ORP (mV):	109.6		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):** 1

**QA/QC:**

Duplicate Sample Station? ( Y / N )

POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR- -MS

POM-W-WR- -MSD

**NOTES:**

- see Field notes; sample is ~~the~~ duplicate, not replicate.

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-20</b>		NORTHING:	EASTING:
INVESTIGATORS: Collins <u>Brightbill</u>		RIVER REACH: Reach 1      Reach 2 <u>Reach 3</u>	
FORM COMPLETED BY: Collins      Brightbill		DATE: <u>11/4/86</u> TIME: <u>9:45</u>	WATER DEPTH: <u>3'</u>

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / <del>No</del>
	<input checked="" type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>110</u> °F
	<input checked="" type="checkbox"/>	<input type="checkbox"/> showers	Other: _____
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	9.82	X	
DO (mg/L):	8.30		Color: clear
DO (% Saturation):	73.3		
pH:	7.23		Odor: none
Conductivity (mS/cm):	0.346		
ORP (mV):	83.7		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

Sample Depth (feet): 1.5'

**QA/QC:**

Duplicate Sample Station? ( Y / N ) Y  
POM-W-WR- 03 -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR-	-MS
POM-W-WR-	-MSD

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-W-WR-20.5 / 0.8					
INVESTIGATORS:		RIVER REACH:			
Collins	Brightbill	Reach 1		Reach 2	Reach 3
FORM COMPLETED BY:		DATE:		WATER DEPTH:	
Collins	Brightbill	11/4/10		~ 5'	
		TIME: 15:15			

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / No
	<input type="checkbox"/>	<input checked="" type="checkbox"/> rain	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> showers	Air Temperature <u>45</u> °F
	<input checked="" type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	16.01	16.01	
DO (mg/L):	9.4	9.47	Color: clear
DO (% Saturation):	83.5	84.2	
pH:	7.36	7.42	Odor: None
Conductivity (mS/cm):	0.297	0.293	
ORP (mV):	111.7	98.9	Other: None

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? (Y / N )

POM-W-WR-205 -DUP

MS/MSD Sample Station? ( Y (N) )

POM-W-WR-	-MS
POM-W-WR-	-MSD

**NOTES:**



**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:	EASTING:
POM-W-WR-22.5 ABC			
INVESTIGATORS:		RIVER REACH:	
Collins	Brightbill	Reach 1	Reach 2
FORM COMPLETED BY:		REACH 3	
Collins	Brightbill	DATE: 11/4/2010	WATER DEPTH: 2
		TIME: 1345	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<u>Yes</u> / No
	<input type="checkbox"/>	<input checked="" type="checkbox"/> rain	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> showers	Air Temperature <u>45</u> °F
	<input checked="" type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/> clear/sunny		

WATER QUALITY PARAMETERS			
Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	8.97	X	
DO (mg/L):	0.299 8.9.11		Color: 2000 Clear
DO (% Saturation):	81.7		
pH:	7.37		Odor: None
Conductivity (mS/cm):	0.299		
ORP (mV):	+119.0		Other:

SURFACE WATER ANALYSES			
Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

Sample Depth (feet): 1

QA/QC:

Duplicate Sample Station? (Y/N) 22.5  
POM-W-WR- -DUP

MS/MSD Sample Station? (Y/N)  
POM-W-WR- -MS  
POM-W-WR- -MSD

[illegible]

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-2310</b>		NORTHING:	EASTING:
INVESTIGATORS: Collins Brightbill		RIVER REACH: Reach 1 Reach 2 <b>Reach 3</b>	
FORM COMPLETED BY: Collins Brightbill		DATE: 11/4/10 TIME: 16:55	WATER DEPTH: 1

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<u>Yes / No</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/> rain	Air Temperature <u>45</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> showers	Other: _____
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	9.9		
DO (mg/L):	9.32		Color: clear
DO (% Saturation):	82.5		
pH:	7.36		Odor: none
Conductivity (mS/cm):	0.296		
ORP (mV):	112.3		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? (Y/N)

POM-W-WR- 23.0 -DUP

MS/MSD Sample Station? (Y/N)

POM-W-WR- -MS

POM-W-WR- -MSD

**NOTES:**

**SURFACE WATER SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-W-WR-24.5</b>		NORTHING:	EASTING:
INVESTIGATORS: Collins Brightbill		RIVER REACH: Reach 1      Reach 2      Reach 3	
FORM COMPLETED BY: Collins Brightbill		DATE: 11/7/6 TIME: 16:45	WATER DEPTH: 18"

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	Yes / <u>No</u>
	<input type="checkbox"/>	<input type="checkbox"/> rain	
	<input checked="" type="checkbox"/>	<input type="checkbox"/> showers	Air Temperature <u>42</u> °F
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	Other:
	<input type="checkbox"/>	<input checked="" type="checkbox"/> clear/sunny	

## WATER QUALITY PARAMETERS

Parameter	Near Bottom (1 foot above sediment)	Surface (1 foot below surface)	Surface Water Characteristics:
Temperature (°C):	4 9.83		
DO (mg/L):	9.05		Color:
DO (% Saturation):	80.0		
pH:	7.34		Odor:
Conductivity (mS/cm):	0.044		
ORP (mV):	125.4		Other:

## SURFACE WATER ANALYSES

Parameter		Unfiltered	Filtered
THg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MeHg		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TSS		<input checked="" type="checkbox"/>	

**Sample Depth (feet):**

**QA/QC:**

Duplicate Sample Station? (Y/N) 075  
POM-W-WR- -DUP

MS/MSD Sample Station? ( Y / N )

POM-W-WR-	-MS
POM-W-WR-	-MSD

**NOTES:**





SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR- 17-A</b>		<b>NORTHING:</b>	<b>EASTING:</b>
<b>INVESTIGATORS:</b> Collins <u>Brightbill</u> <u>SAW</u>		<b>RIVER REACH:</b> <b>REACH 1</b> <u>REACH 2</u> <b>REACH 3</b>	
<b>FORM COMPLETED BY:</b> Collins <u>Brightbill</u> <u>SAW</u>		<b>DATE:</b> 11/05/2010 <b>TIME:</b> 1045	<b>WATER DEPTH:</b> 18"

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? <u>Yes</u> / No  Air Temperature <u>45</u> °F  Other:	
	<input type="checkbox"/>	<input type="checkbox"/>		storm
	<input type="checkbox"/>	<input checked="" type="checkbox"/>		rain
	<input type="checkbox"/>	<input checked="" type="checkbox"/>		showers
	<input checked="" type="checkbox"/>	<input type="checkbox"/>		partly cloudy
<input type="checkbox"/>	<input type="checkbox"/>	clear/sunny		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	25% <u>10%</u>
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	
Sand	0.06-2 mm (gritty)	60% (medium sand)	Marl	grey, shell fragments	
Silt	0.004-0.06mm	40%			
Clay	<0.004 mm (slick)				

<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>	
Substrate color: <u>brown</u>			Temperature (°C): <u>10.47</u>	
Substrate consistency: <u>silty sand (medium sand)</u>			DO (mg/L): <u>4.18</u>	DO (% Sat): <u>82.2</u>
Floc layer present: <u>none</u>			pH: <u>7.19</u>	
Moisture conditions: <u>high</u>			Conductivity (mS/cm): <u>0.305</u>	
Benthic fauna: <u>none observed</u>			ORP (mV): <u>96.2</u>	
<b>Odors</b> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic (H <sub>2</sub> S) <input checked="" type="checkbox"/> <u>None</u> Other _____				
<b>Oils</b> <u>Absent</u> Slight Moderate Profuse				

<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>	
Parameter	0-0.5'		Duplicate Sample Station? <u>(Y/N)</u>	
THg	<input checked="" type="checkbox"/>		POM-E-WR-17A -DUP	
Grain Size/TOC	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N)	
			POM-E-WR- -MS	
			POM-E-WR- -MSD	

<b>NOTES:</b>	<u>detritus is mainly leaf debris</u>
	<u>minimal fine grain sediment in this location of river</u>



SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR-17-B</b>		<b>NORTHING:</b>	<b>EASTING:</b>
<b>INVESTIGATORS:</b> Collins Brightbill <i>SAW</i>		<b>RIVER REACH:</b> REACH 1 <i>REACH 2</i> REACH 3	
<b>FORM COMPLETED BY:</b> Collins Brightbill <i>SAW</i>		<b>DATE:</b> 11/5/10 <b>TIME:</b> 10:15	<b>WATER DEPTH:</b> 18"

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes / No  Air Temperature <i>60</i> °F  Other:	
	<input type="checkbox"/>	<input type="checkbox"/>		storm
	<input type="checkbox"/>	<input checked="" type="checkbox"/>		rain
	<input checked="" type="checkbox"/>	<input type="checkbox"/>		showers
	<input type="checkbox"/>	<input type="checkbox"/>		partly cloudy
	<input type="checkbox"/>	<input type="checkbox"/>		clear/sunny

INORGANIC SUBSTRATE COMPONENTS			ORGANIC SUBSTRATE COMPONENTS		
(should add up to 100%)			(does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	15-20
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")	15	Muck-Mud	black, very fine organic (FPOM)	
Sand	0.06-2 mm (gritty)	25			
Silt	0.004-0.06mm	60	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)				

<b>SEDIMENT CHARACTERIZATION</b>			<b>NEAR BOTTOM WATER QUALITY:</b>		
Substrate color: <i>dark brown</i>			Temperature (°C): <i>10.36</i>		
Substrate consistency: <i>sandy silt</i>			DO (mg/L): <i>8.58</i> DO (% Sat): <i>76.8</i>		
Floc layer present: <i>No</i>			pH: <i>7.12</i>		
Moisture conditions: <i>medium</i>			Conductivity (mS/cm): <i>0.303</i>		
Benthic fauna: <i>amphipods</i>			ORP (mV): <i>129.2</i>		
<b>Odors</b> Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None <i>Other hydrocarbon slight</i>					
<b>Odors</b> Absent <i>Slight</i> Moderate Profuse					

<b>SEDIMENT ANALYSES</b>			<b>QA/QC:</b>		
Parameter	0-0.5'		Duplicate Sample Station? (Y/N) POM-E-WR- -DUP		
THg	<input checked="" type="checkbox"/>		MS/MSD Sample Station? (Y/N) POM-E-WR- <i>17B</i> -MS POM-E-WR- <i>17B</i> -MSD		
Grain Size/TOC	<input checked="" type="checkbox"/>				

<b>NOTES:</b>
<i>65% recovery</i>
<i>moderate hydrocarbon sheen over water</i>
<i>sample slightly below low water mark on right bank</i>

**SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION:		NORTHING:		EASTING:	
POM-E-WR- 17C					
INVESTIGATORS:		RIVER REACH:			
Collins	Brightbill	REACH 1      REACH 2      REACH 3			
FORM COMPLETED BY:		DATE:		WATER DEPTH:	
Collins	Brightbill	11/5/00		18"	

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days?
	<input type="checkbox"/>	<input type="checkbox"/> storm	<input checked="" type="radio"/> Yes / No
	<input type="checkbox"/>	<input checked="" type="checkbox"/> rain	Air Temperature <u>45</u> °F
	<input checked="" type="checkbox"/>	<input type="checkbox"/> showers	Other:
	<input type="checkbox"/>	<input type="checkbox"/> partly cloudy	
	<input type="checkbox"/>	<input type="checkbox"/> clear/sunny	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5%
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")				
Gravel	2-64 mm (0.1-2.5")		Muck-Mud	black, very fine organic (FPOM)	
Sand	0.06-2 mm (gritty)	15 medium			
Silt	0.004-0.06mm	60	Marl	grey, shell fragments	
Clay	<0.004 mm (slick)	25			

SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:	
Substrate color:			Temperature (°C):	10.31
Substrate consistency: 2" silty-silt overtop clay			DO (mg/L): 8.24	DO (% Sat): 93.0
Floc layer present: Yes 2mm			pH:	7.11
Moisture conditions:			Conductivity (mS/cm):	2303
Benthic fauna: blood red chironomids			ORP (mV):	160.1
<b>Odors</b> Normal                      Sewage                      Petroleum Chemical <u>Anaerobic (H<sub>2</sub>S)</u> None Other _____				
<b>Oils</b> Absent                      Slight                      Moderate                      Profuse				

SEDIMENT ANALYSES		
Parameter	0-0.5'	
THg		<input checked="" type="checkbox"/>
Grain Size/TOC		<input checked="" type="checkbox"/>

QA/QC:

Duplicate Sample Station? (Y/N) **(N)**

POM-E-WR- -DUP

MS/MSD Sample Station? (Y/N) **(N)**

POM-E-WR- -MS

POM-E-WR- -MSD

**NOTES:**

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SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE

<b>SAMPLE IDENTIFICATION:</b> <b>POM-E-WR- 18-A</b>		<b>NORTHING:</b>	<b>EASTING:</b>
<b>INVESTIGATORS:</b> Collins Brightbill		<b>RIVER REACH:</b> <b>REACH 1</b> <b>REACH 2</b> <b>REACH 3</b>	
<b>FORM COMPLETED BY:</b> Collins Brightbill <i>SAW</i>		<b>DATE:</b> 11/3/16 <b>TIME:</b> 8:45	<b>WATER DEPTH:</b> 1'

<b>WEATHER CONDITIONS</b>	Now	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes / No  Air Temperature <u>7</u> °F  Other:	
	<input type="checkbox"/>	<input type="checkbox"/>		storm
	<input type="checkbox"/>	<input checked="" type="checkbox"/>		rain
	<input checked="" type="checkbox"/>	<input type="checkbox"/>		showers
	<input type="checkbox"/>	<input type="checkbox"/>		partly cloudy
	<input type="checkbox"/>	<input type="checkbox"/>		clear/sunny

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")		Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1-2.5")		Marl	grey, shell fragments	0
Sand	0.06-2 mm (gritty)	5			
Silt	0.004-0.06mm	80			
Clay	<0.004 mm (slick)	15			

<b>SEDIMENT CHARACTERIZATION</b>		<b>NEAR BOTTOM WATER QUALITY:</b>	
Substrate color: <i>tan over gray</i>		Temperature (°C): <i>10.17</i>	
Substrate consistency: <i>1cm silt / sand over gray clay / silt</i>		DO (mg/L): <i>8.14</i> DO (% Sat): <i>77.5</i>	
Floc layer present: <i>No</i>		pH: <i>6.6</i>	
Moisture conditions: <i>medium</i>		Conductivity (mS/cm): <i>0.303</i>	
Benthic fauna: <i>chaetognaths, bloodworm</i>		ORP (mV): <i>213</i>	
<b>Odors</b>			
Normal	Sewage	Petroleum	
Chemical	Anaerobic (H <sub>2</sub> S)	None	
Other _____			
<b>Oils</b>			
Absent	Slight	Moderate	Profuse

<b>SEDIMENT ANALYSES</b>		<b>QA/QC:</b>	
<b>Parameter</b>	<b>0-0.5'</b>	Duplicate Sample Station? (Y/N) <b>(N)</b>	
THg	<input checked="" type="checkbox"/>	POM-E-WR- -DUP	
Grain Size/TOC	<input checked="" type="checkbox"/>	MS/MSD Sample Station? (Y/N) <b>(N)</b>	
		POM-E-WR- -MS	
		POM-E-WR- -MSD	

<b>NOTES:</b>	<i>95% recovery. Thin 1cm silt/sand layer brown over top gray clay/silt</i>
	<i>no shen</i>

**SEDIMENT SAMPLE CHARACTERIZATION  
WANAQUE RIVER VALLEY INVESTIGATION  
DUPONT POMPTON LAKES WORKS SITE**

SAMPLE IDENTIFICATION: <b>POM-E-WR- 183</b>			NORTHING:	EASTING:	
INVESTIGATORS: Collins Brightbill SAW			RIVER REACH: REACH 1 REACH 2 REACH 3		
FORM COMPLETED BY: Collins Brightbill SAW			DATE: 11/15/10 TIME: 9:10	WATER DEPTH: 1'	
WEATHER CONDITIONS		Now <input type="checkbox"/> storm <input type="checkbox"/> rain <input checked="" type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input type="checkbox"/> clear/sunny	Past 24 hours <input type="checkbox"/> storm <input checked="" type="checkbox"/> rain <input type="checkbox"/> showers <input type="checkbox"/> partly cloudy <input type="checkbox"/> clear/sunny		
		Has there been a heavy rain in the last 7 days? Yes / No			
		Air Temperature 65 °F			
		Other:			
INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Characteristic	Approximate % Composition in Sample	Substrate Type	Characteristic	Approximate % Composition in Sample
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1-2.5")				
Sand	0.06-2 mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06mm	100			
Clay	<0.004 mm (slick)				
SEDIMENT CHARACTERIZATION			NEAR BOTTOM WATER QUALITY:		
Substrate color: dark brown to gray			Temperature (°C): 10.1		
Substrate consistency: Silty clay, slightly plastic			DO (mg/L): 8.3 DO (% Sat): 44.6		
Floc layer present: 4mL Yes			pH: 6.93		
Moisture conditions:			Conductivity (mS/cm): 0.303		
Benthic fauna: blood red chironomids			ORP (mV): 43.5		
Odors Normal Sewage Petroleum Chemical Anaerobic (H <sub>2</sub> S) None Other _____					
Oils Absent Slight Moderate Profuse					
SEDIMENT ANALYSES			QA/QC:		
Parameter	0-0.5'		Duplicate Sample Station? ( Y/N )		
THg	<input checked="" type="checkbox"/>		POM-E-WR- -DUP		
Grain Size/TOC	<input checked="" type="checkbox"/>		MS/MSD Sample Station? ( Y/N )		
			POM-E-WR- -MS		
			POM-E-WR- -MSD		
NOTES: 100% recovery					

**Appendix E**


**Analytical Data Packages (CD)**



**Appendix F**  
**Photographic Log**





## PHOTOGRAPHIC LOG

<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 1	<b>Date:</b> 12/07/2009		
<b>Direction Photo Taken:</b> Northwest			
<b>Description:</b> Sampling location WR-01			

<b>Photo No.</b> 2	<b>Date:</b> 12/07/2009	
<b>Direction Photo Taken:</b> Northeast		
<b>Description:</b> Sampling Location WR-02		




<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 3	<b>Date:</b> 12/07/2009		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Sampling location WR-03			


<b>Photo No.</b> 4	<b>Date:</b> 12/16/2009	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> Sampling Location WR-04		





## PHOTOGRAPHIC LOG


<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 5	<b>Date:</b> 12/07/2009		
<b>Direction Photo Taken:</b> West			
<b>Description:</b> Sampling location WR-05			

<b>Photo No.</b> 6	<b>Date:</b> 12/16/2009	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> Sampling Location WR-06		





## PHOTOGRAPHIC LOG


<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 7	<b>Date:</b> 12/07/2009		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Sampling location WR-07			


<b>Photo No.</b> 8	<b>Date:</b> 12/07/2009	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> Sampling Location WR-08		






## PHOTOGRAPHIC LOG

<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 9	<b>Date:</b> 12/07/2009		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Sampling location WR-09			

<b>Photo No.</b> 10	<b>Date:</b> 12/18/2009	
<b>Direction Photo Taken:</b> Northeast		
<b>Description:</b> Sampling Location WR-10		




<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 11	<b>Date:</b> 12/18/2009		
<b>Direction Photo Taken:</b>  North			
<b>Description:</b>  Sampling location WR-11			

<b>Photo No.</b> 12	<b>Date:</b> 12/18/2009	
<b>Direction Photo Taken:</b>  North		
<b>Description:</b>  Sampling Location WR-12		






## PHOTOGRAPHIC LOG

<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 13	<b>Date:</b> 12/18/2009		
<b>Direction Photo Taken:</b>  North			
<b>Description:</b>  Sampling location WR-13			


<b>Photo No.</b> 14	<b>Date:</b> 12/18/2009	
<b>Direction Photo Taken:</b>  North		
<b>Description:</b>  Sampling Location WR-14		




<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 15	<b>Date:</b> 12/17/2009		
<b>Direction Photo Taken:</b>  North			
<b>Description:</b>  Sampling location WR-15			


<b>Photo No.</b> 16	<b>Date:</b> 12/08/2009	
<b>Direction Photo Taken:</b>  North		
<b>Description:</b>  Sampling Location WR-16		



<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 17	<b>Date:</b> 12/08/2009		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Sampling location WR-17			


<b>Photo No.</b> 18	<b>Date:</b> 12/16/2009	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> Sampling Location WR-02		



<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 19	<b>Date:</b> 12/08/2009		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Sampling location WR-19			

<b>Photo No.</b> 20	<b>Date:</b> 12/08/2009	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> Sampling Location WR-20		




<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 21	<b>Date:</b> 12/08/2009		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Sampling location WR-21			


<b>Photo No.</b> 22	<b>Date:</b> 12/08/2009	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> Sampling Location WR-22		







## PHOTOGRAPHIC LOG

<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 23	<b>Date:</b> 12/08/2009		
<b>Direction Photo Taken:</b> North			
<b>Description:</b> Sampling location WR-23			


<b>Photo No.</b> 24	<b>Date:</b> 12/08/2009	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> Sampling Location WR-24		



<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 25	<b>Date:</b> 12/16/2009		
<b>Direction Photo Taken:</b>  East			
<b>Description:</b>  ATV trail within the site in the vicinity of WR-11 and WR-12.			

<b>Photo No.</b> 26	<b>Date:</b> 12/16/2009	
<b>Direction Photo Taken:</b>  West		
<b>Description:</b>  ATV trail within the site in the vicinity of WR-11 and WR-12.		




<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 25	<b>Date:</b> 12/16/2009		
<b>Direction Photo Taken:</b> West			
<b>Description:</b> ATV trail beneath I-287			

<b>Photo No.</b> 26	<b>Date:</b> 12/16/2009	
<b>Direction Photo Taken:</b> West		
<b>Description:</b> Eroding bank immediately downstream of I-287.		





## PHOTOGRAPHIC LOG

<b>Client Name:</b> DuPont		<b>Site Location:</b> Wanaque River Valley	<b>Project No.</b> 18985452
<b>Photo No.</b> 25	<b>Date:</b> 12/16/2009		
<b>Direction Photo Taken:</b>  East			
<b>Description:</b>  ATV trail within the site in the vicinity of WR-11 and WR-12.			

<b>Photo No.</b> 26	<b>Date:</b> 12/16/2009	
<b>Direction Photo Taken:</b>  East		
<b>Description:</b>  Eroding bank in the downstream of sampling location WR-10		